Dental d.b.
Direct

THE JOURNAL
of the
AMERICAN DENTAL ASSOCIATION

Vol. 29 JULY 1, 1942 No. 9

GOLD FOIL RESTORATIONS FOR INCIPIENT DECAY

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SINCE the subject of gold foil has been written about exhaustively and taught in dental colleges for many years as the basis of operative dentistry, I shall confine my paper to restoration, with gold foil, of areas of incipient decay. The types of cavities that I shall discuss are Classes 1, 2, 3 and 5, numbered according to the classification of cavities as outlined by G. V. Black.

Cavities of these types are the outstanding indication for the use of gold foil, which can be employed by a skilful operator to restore permanently both the contour and the function of the teeth affected. Esthetic requirements too can be satisfied in most cases by a harmonious correlation of cavity outline form with tooth form. In case gold fillings in the anterior teeth are objectionable to the patient, porcelain inlays can be used.

Many dentists say that they would like to employ foil because they have observed the fine results obtained by those trained in its use. In many instances, however, these dentists have not filled a single cavity with gold foil since graduating from college. A haphazard technic, combined with wishful thinking, ends only in grief, for both patient and operator. In most cases, a foil filling is either a success or a failure before the patient leaves the office. A thorough knowledge of cavity preparation and the manipulation of gold foil is necessary. When these are mastered, artistic and permanent restorations become routine.

Since a complete paper could be written about each class of cavity to be discussed, I shall go to some length in describing the cavity preparation and the insertion and finishing of foil for a Class 3 restoration. Although equal care must be used in placing foil in the other types of cavities, in my own experience mastery of technic for a Class 3 gave a feeling of confidence I sorely needed.

Gold foil restoration of Class 3 cavities on the proximal surfaces of upper and lower incisors demands the utmost in skill and artistry from the operator. It is here that the esthetic taste of the patient must be considered before a de-

Read before the Section on Operative Dentistry, Materia Medica and Therapeutics at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 29, 1941.

cision is made to place a foil filling. Gold having been chosen for the restoration, it is possible to obtain a harmonious and permanent result by outlining the cavity so that the labial aspect shall blend with the tooth contour to the extent that the finished filling will be inconspicuous.

After the rubber dam is applied, preparation of a Class 3 cavity (Fig. 1, left) is started by gaining access to the decayed area through the labial enamel with a small hoe or chisel. The next step, and probably the most important in obtaining the outline form, is the establishment of the gingival wall. Once this wall is formed, the remainder of the cavity seems to shape itself. The gingival wall lingual walls of a Class 3 cavity diverge from the axial wall, the filling is retained between the gingival wall and the incisal angle. Therefore, the gingival wall slopes inward toward the axial wall, the axiogingival angle being slightly acute. The incisal angle is cut in dentin with a 3-1-28 hatchet. It is a point angle, formed by the junction of the axiolabial and axiolingual line angles.

The interior of the cavity when completed will have sharply defined line and point angles and smoothly planed walls. The final step of preparation is the correction of minor defects in the labial and lingual outlines and the beveling of all cavosurface margins. Figure 1

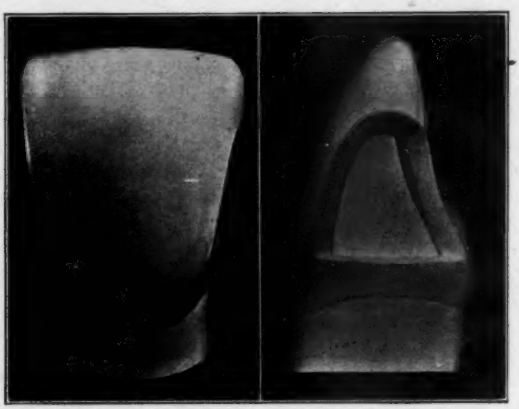

Fig. 1.—Left: Typical outline form for Class 3 foil in upper central incisor. The esthetic requirements are satisfied by harmonious correlation of the cavity outline with the tooth contour. Right: Class 3 cavity preparation; showing extension of gingival wall to form distinct shoulder at lingual aspect. The enamel of the labial and lingual walls is well beveled.

is cut with a No. 33½ or 34 bur in a straight handpiece, the operator working from the labial to the lingual surface and cutting through the lingual plate of enamel, establishing the linguogingival shoulder.

The labial and lingual outlines of the cavity are next established with chisels. Then the interior of the cavity is formed with a small hoe, No. 23 of the set designed by W. I. Ferrier, and a pair of small angle formers. Since the labial and shows the special features to be noted in this preparation. 1. The labial outline, for most of its length, is parallel to the lobe of the tooth in which the cavity occurs. 2. The linguogingival shoulder presents a wall against which direct mallet force can be used to condense foil. 3. Removal of what Dr. Ferrier calls excess stock under the labial wall near the incisal angle brings the entire interior of the cavity into view. 4. The gingival wall is straight, and generally at a right

angle to the long axis of the tooth. 5. The axial wall is flat, forming slightly obtuse angles with the labial and lingual walls. 6. The convenience or retention points at the gingival and the incisal angles are definitely cut and easily accessible for starting the filling and then tying it in.

I shall now show illustrations of a typical labial outline of a Class 3 restoration and three variations of a typical Class 3 cavity. (Fig. 1, right.) These cavities vary only in outline and are adapted to specific surfaces of certain incisors. The first variation is a preparation for the distal surface of an upper lateral incisor, which is used when that surface is decidedly rounded. (Fig. 2, left.) The labial outline, which is cut straight from the incisal cavosurface margin to the labiogingival margin, is for its entire length parallel to the distal lobe of the tooth. (Fig. 2, right.) The second variation is a preparation for the distal surface of an upper cuspid. This too presents a labial and lingual outline cut straight from the incisal cavosurface margin to the labiogingival and linguogingival margins. The object of the special labial outline form as shown for the rounded distal surface of an upper lateral incisor is a good appearance. The preparation for the distal surface of an upper cuspid is made for access. It may be easily seen that a direct approach to the broad labiolingual dimension of the gingival wall of such a cavity will aid the operator materially in placing and condensing foil. (Fig. 3, left.)

The third variation is a preparation for Class 3 cavities occurring in the lower central and lateral incisors. (Fig. 3, right.) The prepared cavity has the same labial outline as the typical prepared area, but the lingual wall is left standing to support the incisal angle of the tooth.

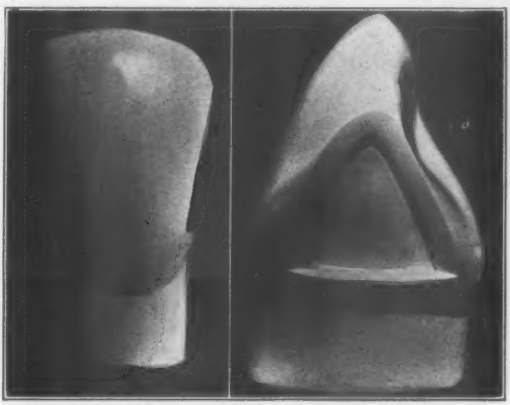

Fig. 2.—Left: Class 3 foil filling, showing labial outline used on distal surface of upper lateral surface only when distinctly rounded contour is presented. Right: Cavity preparation for restoration of distal surface of upper cuspid. The distal angle of the tooth is eliminated for access to the broad gingival wall. The labial and lingual walls are well boxed.

Lingual extension is sufficient only for a margin that can be finished. All foil is placed through the labial opening.

A cohesive foil restoration is started in a Class 3 cavity by placing either a one one-twenty-eighth or a one sixty-fourth pellet of gold in the axiolinguogingival angle, holding it in place with an instrument designed for that purpose and condensing it with either a No. 1 straight, or a No. 1 Carlson plugger. (Fig. 1.) Two or three pellets may have to be

placed here, in order to obtain sufficient bulk of gold to allow the operator to proceed across the axiogingival angle and gingival wall toward the axiolabiogingival angle, without tipping or distorting the original mass of gold. The filling should be held securely until it is tied by condensing foil into the axiolabiogingival angle. Experience will tell the operator when it is safe to abandon the holding instrument.

The next, and a very important step, is to cover the linguogingival shoulder. This is done by a direct drive from the incisal aspect, along the lingual margin, against the lingual extension of the gingival wall. From this point on, the greater part of the gold is placed through the labial approach. The gingival wall and cavosurface angle are fully covered. Then gold is built toward the incisal angle for the entire labiolingual dimension of the cavity, with the lingual portion ahead of the labial. When the incisal third of the lingual wall is reached, foil is placed in the incisal angle, condensed first with a right-angle hand-pressure plugger, and then with a bayonet plugger and mallet force. After the main body of the filling and the foil in the incisal angle have been joined by the addition of more condensed gold, the most exacting part of the filling technic must be done immediately. A separator is applied and is blocked with impression compound. This not only gives access for placing foil over the incisal third of the lingual wall, but also braces the tooth and distributes the shock of malleting over three or four teeth. When a well-blocked separator has been used, a patient rarely complains of soreness, even after a very extensive restoration.

The operator is now ready to make the turn of the lingual wall to the incisal cavosurface margin. From a position behind the patient, he condenses foil against the incisal third of the lingual wall, approaching with a plugger from the direction of the labiogingival angle. Enough foil is placed from this position to cover the lingual wall to excess, as well as the incisal cavosurface margin. From here on, the filling is rapidly built to form. The excess foil over the lingual margin will be appreciated when the operator goes to the lingual portion to finish condensation of that surface. It

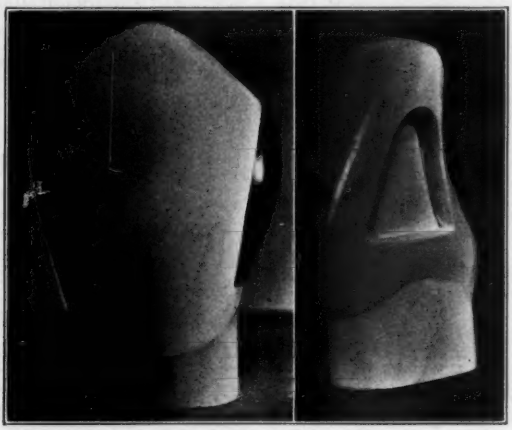

Fig. 3.—Left: Outline of foil restoration on distal surface of upper cuspid. Right: Cavity preparation for proximal surface of lower incisor. This is a typical Class 3 labial outline form, but the lingual wall has been left standing to support the incisal angle of the tooth.

is well to remember that a proper line of force must be maintained during the entire condensing procedure. Orderly stepping of the plugger is necessary to insure a filling of fine consistency, free from pits and blemishes. (Fig. 4.)

Class 3 foil fillings can be finished quickly by developing a routine procedure, which soon becomes automatic. The tension of the separator and condensation of the foil will have produced a contour slightly too convex. A Gordon White saw is passed by the contact point,

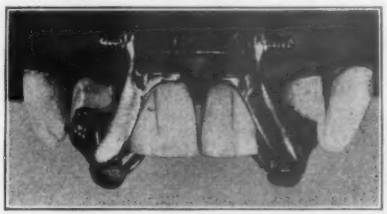

Fig. 4.—Application of Ferrier separator. With sufficient blocking with compound, the force of the malleting is distributed over four or more teeth.

Fig. 5.—Class 1 cavity preparation in upper molar. Use of a right-angle Hollenback pneumatic plugger gives access for condensation of the gold foil.

followed by a steel strip and linen strips. The proximal surface of the filling and contact point are nearly finished. The separator can be removed now or after the gingival margin has been finished. The labial and lingual margins are cut to form with a gold knife, followed by files, the entire restoration being finished finally with very fine cuttle strips.

I have gone to some length in describing the cavity preparation and the insertion and finishing of foil fillings for a Class 3 restoration. Just as much care must be used in placing foil for any other type of restoration, but detailed description would be only a repetition of fundamental principles.

Class 1 cavities are especially well treated when filled with gold foil. The procedure is simple, tooth structure is conserved and prevention of the recurrence of decay is assured. The use of the right angle pneumatic plugger, designed by Hollenback for foil condensation, has made access to occlusal cavities in upper and lower second molars and lingual pits in upper incisors very easy. (Fig. 5.)

Class 5 cavities with incipient decay,

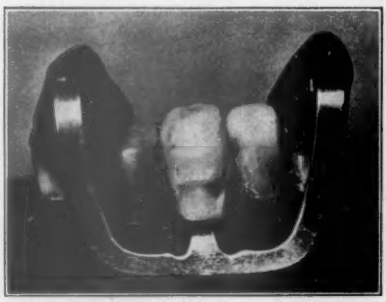

Fig. 6.—Gingival clamp in place and blocked with compound for Class 5 restoration.

including toothbrush erosion, which show a sharp v-shaped ditch at the gingival margin of buccal and labial surfaces is a definite indication for the use of gold foil. Class 5 cavities generally outline themselves as far as shape is concerned. The cavity preparation is made after the application of the rubber dam and the placing and blocking of a gingival clamp. (Figs. 6 and 7, left.) The cavity in its typical form has the outline of a truncated cone with its base toward the occlusal or incisal surface of the tooth. The mesial and distal walls flare away from the axial wall. The gingival and occlusal, or incisal, walls are slightly

undercut. Line and point angles are sharply defined. The cavosurface margins receive a slight bevel by the planing away of any short enamel rods left when the walls are cut.

Non-cohesive foil cylinders of a size to fit each wall are placed, one at a time, on end in the cavity, and condensed against each wall by hand pressure, with parallelogram pluggers. The cavity walls are thus entirely covered with non-cohesive foil, with the ends of the cylinders extending slightly beyond the cavosurface margins. The cohesive foil is started along the axiogingival angle and is retained by means of a holding instrument, until sufficient bulk of it has been condensed between the gingival and occlusal, or incisal, walls to insure its retention. The cohesive foil is built saucer shaped, the operator stepping the plugger from the center of the cavity toward the margins, pinching off the excess non-cohesive foil at the margins. If care is used, very little overfilling occurs. It is well to use one one-twenty-eighth pellets when condensing at the gingival cavosurface margin to avoid overfilling, with a subsequent loss of time in finishing. (Fig. 7, right.)

When the gingival margin of the cavity is beyond the cemento-enamel junction, especial care is needed in finishing the filling to avoid ditching the cementum. After the desired contour has been obtained by the use of knife, files and small fine disks, Class 5 fillings are highly polished, for a large part of the filling will soon be covered by gum tissue. Gingival irritation around these fillings is conspicuous by its absence, a pulp death is rare and decay seldom recurs unless gum recession exposes the cementum beyond the gingival margin.

Class 2 cavities with incipient decay are treated in the most effective and conservative way with gold foil restorations. Figure 8 shows how conservatively these cavities can be cut and still have all the requirements for extension for prevention of recurrence of decay as laid down by G. V. Black. The gingival wall is cut wider than the space between the buccal and lingual walls will be at the occlusal surface when the cavity is completed. In other words, the buccal and lingual walls converge toward the occlusal surface. Extension only into immune areas is sufficient. The buccal and lingual walls of the proximal portion of

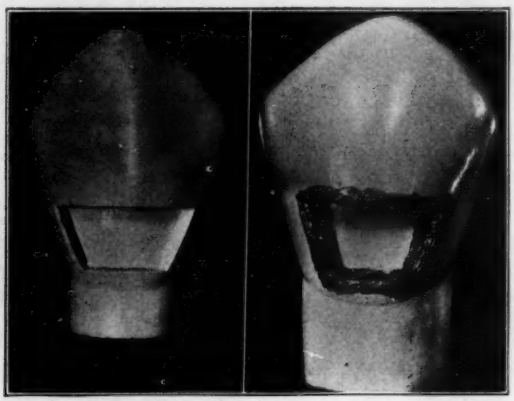

Fig. 7.—Left: Typical outline of Class 5 cavity, showing incisal and gingival walls slightly undercut and mesial and distal walls flared. Right: Non-cohesive foil cylinders condensed by hand pressure against walls of Class 5 cavity; remainder of cavity filled with cohesive gold.

the cavity flare away slightly from the axial wall. Line and point angles are definitely cut. (Fig. 9.)

Retention for this type of filling is provided in the occlusal step, which is cut with a dovetail. The operator's eye for proportion will tell him how wide the step should be. Occlusal steps will vary in depth according to the thickness of enamel, height of cusps, stress of mastication and depth of sulci. As a general rule, the pulpal wall should be in dentin, placed deeply enough to allow the placing of sufficient cohesive foil to insure against breakage of the proximal portion of the filling from the occlusal portion.

Fig. 8.—Class 2 cavity preparation on upper bicuspid, showing extension of gingival wall and convergence of buccal and lingual walls toward occlusal surface.

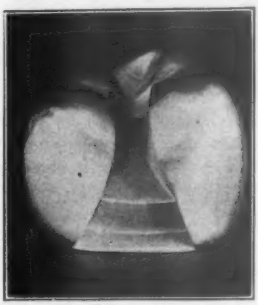

Fig. 9.—Occlusal step of Class 2 cavity, which is narrow enough for pulp protection, yet amply wide for strength of filling.

Care must be used to avoid undercutting the buccoclusal and linguoclusal walls of Class 2 cavities. The middle third of each wall actually slopes slightly away from the pulpal wall. This not only serves to eliminate undermining enamel rods which might break later under masticating pressure, but also keeps the buccopulpal and linguopulpal line angles farther from the horns of the pulp. If the cavity is mesioclusal, the distal portion of the step is dovetailed. Here, definite line and point angles are estab-

Fig. 10.—Use of non-cohesive gold foil cylinders in proximal portion of Class 2 cavity, simplifying finishing of gingival margin and greatly reducing malleting time.

Fig. 11.—Cavity preparation for mesial surface of lower first bicuspid; retention form under buccal and lingual walls.

lished as a starting place for cohesive foil, and as a means of retention of the filling. Planing of the occlusal cavosurface margins should be done in a horizontal, instead of a vertical plane, as the inclination of the enamel rods is such that they are not parallel to the wall of which they form the margin.

The filling of a Class 2 cavity is simplified by placing three non-cohesive foil cylinders in the proximal portion. (Fig. 10.) One cylinder is placed against the buccal wall, one against the lingual wall and the third in the center between them. Each cylinder is forced to place with hand pressure, with a parallogram plugger. When the third cylinder is in place, a bayonet type plugger with a condensing surface about 1.5 mm. in diameter is used with mallet force and hand pressure, to give the non-cohesive foil its final condensation. Non-cohesive foil will fill the proximal portion of the cavity almost to the pulpal wall. At this point, the cavity is nearly half filled. Cohesive foil is now started in the dovetail at the opposite end of the step. It is only necessary to hold a few pellets in place until sufficient bulk of gold is inserted and condensed to allow the operator full freedom of each hand. After retention of the starting pellets is secured, cohesive foil is built along the pulpal wall out over the non-cohesive gold in the proximal portion of the cavity. The cohesive foil is placed in such a manner that many layers of condensed foil lie one on another, each succeeding layer being condensed by an orderly stepping of the plugger from within the cavity toward the walls and margins. Condensation of the foil in a Class 2 cavity automatically takes care of the proximal contact. No separator is needed until time for the finishing of the proximal surface and

Fig. 12.—Occlusal view of cavity shown in Figure 11. No step is cut and the finished filling is very inconspicuous.

Fig. 13.—Cavity preparation for distal surface of lower first bicuspid, showing slope of pulpal wall protecting buccal horn of pulp.

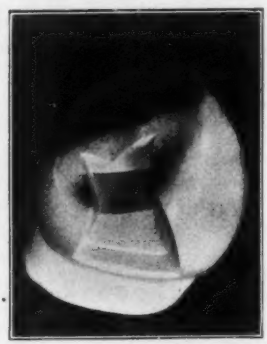

Fig. 14.—Occlusal view of cavity in Figure 13. The step does not cross the transverse ridge. Most of the cutting is done at the expense of the lingual cusp, on which there is no masticating stress.

contact point. When the desired occlusal form has been obtained, all margins have been thoroughly covered and the foil has been well condensed, finishing of the filling is started.

The first step in finishing a Class 2 filling is to cut the excess non-cohesive foil from the gingival margin with a sharp knife. Then a fine garnet strip is passed through the space thus obtained, and the gingival margin is quickly finished. Next, the occlusal contour is carried out as indicated, being brought to completion with mounted stones, finishing burs and a cleoid. Now a separator is applied, blocked with compound and tightened slightly, and a Gordon White saw is passed through the contact. The proximal surface and contact point of the filling are soon finished with a knife, files and strips. The separator is removed after but a few minutes' use. A final high polish is given the filling with powdered pumice and a polishing silicate.

Many dentists make these restorations in less time than they consume in taking an impression for an inlay and setting and polishing it. Class 2 foil restorations for cavities with incipient decay are worthy of serious consideration by the dentist who desires to make the most nearly permanent and most conservative fillings possible.

Two variations of the typical Class 2 preparation are those used exclusively with lower bicuspids. Figure 11 shows a preparation for the mesial surface of a lower first bicuspid in which there is no step. Retention is gained by cutting the cavity with a retentive form under the buccal and lingual walls. (Fig. 12.) If there is any filling in the mouth to which a patient could object for its conspicuousness, it would be a large one here, involving part of the occlusal surface. The preparation shown eliminates the cause for such an objection.

This type of cavity is very simple to cut and is quickly filled with cohesive foil. The separator is applied and blocked before starting the cavity, if this will aid the operator to be more conservative in the preparation.

The other variation of a Class 2 cavity is illustrated in Figure 13, showing preparation of the distal surface of a lower first bicuspid. In this preparation, a step is cut, but is confined to the occlusal half of the tooth in which the cavity occurs. The step is not cut through the transverse ridge. The pulpal wall is sloped with the inclination of the occlusal surface, and most of the cutting is done at the expense of the lingual cusp, upon which there is no masticating stress. (Fig. 14.)

It is not within the scope of this paper to give a detailed description of each instrument stroke or to list the instruments to be used. It has been my purpose rather to present illustrations of the most common types of cavities for which gold foil restorations are indicated. Well-designed instruments, suitable for use in cutting cavities to receive gold foil, as well as rubber dam clamps, separators, condensing pluggers, etc., have been on the market for years.

Scores of dentists using this identical technic in their practice have found that the meticulous attention to detail developed by the use of gold foil has been responsible for a distinct improvement of their entire operative procedure. The results obtained by these dentists are convincing evidence that gold foil is an ideal material for the restoration of areas of incipient decay.

General Insurance Building.

TREATMENT OF VINCENT'S INFECTION OF THE MOUTH

By ISADOR HIRSCHFELD, D.D.S., New York, N. Y.

DURING the first World War and for several years thereafter, periodontists were confronted with large numbers of cases of acute Vincent's infection, mostly of the destructive type (Fig. 1) and showing nearly all the symptoms attributable to that disease. Since then, however, comparatively few of the cases seen by periodontists are acute, and, of these, the majority present fewer severe symptoms. Most of the cases seen are of the subacute (Figs. 2, 3 and 4) or chronic (Fig. 5) types.

In attempting to account for this marked change, several possibilities suggest themselves: (1) a natural tendency for the infection to become endemic, with time; (2) a modification of the symptoms by partial control through the use of mouthwashes advertised to "stop bleeding of the gums"; (3) a wider prevalence of toothbrushing due to dentifrice advertising which recommends brushing (with the product advertised) for the prevention and control of "pink toothbrush," "gingivitis," etc., and (4) the fact that the general dental practitioner has, during the last ten or twelve years, become more or less alert in the diagnosis of Vincent's infection and has familiarized himself with its treatment. But, in spite of the fact that many cases are effectively and completely taken care of by the general practitioner, there are some instances in which he discharges the patient prematurely, in the belief that the infection has been completely eliminated.

Similarly, many a partly treated case results from treatment by a physician with only an oxidizing mouthwash, and without a dentist's cooperation. In this respect, it is interesting to quote an observation by Parks[1] that "more cases of Vincent's infection have been caused by using medicines only and dismissing the cases as cured when actually they are not than in any other way."

We need not take false hope in the apparent decline in the incidence of acute Vincent's infection, since this is not necessarily an indication of a decreased predisposition to the disease generally. On the contrary, close observation points to its increasing prevalence, though, on the whole, in a milder form. This is a challenge to the healing art in that chronic or subacute forms of the disease, like its acute form, are a potential menace to health generally, and, under certain conditions, may prove directly or indirectly to be serious.

In current literature on Vincent's infection, one finds that most of the drugs recommended are being used with evident success, and that, more recently, vitamin therapy is being widely endorsed on the basis of experimental findings.[2] Yet, on the whole, there is still quite a divergence of opinion in regard to procedure in treatment. The practitioner who is confronted with results that are not completely satisfactory is thus apt to be in a quandary as to what method to follow. Evidence of this uncertainty as to some phases of treatment becomes

Read before the Section on Periodontia at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 29, 1941.

more and more apparent to the clinician and lecturer from the questions directed to him. Therefore, it is considered timely to attempt to clarify and reconcile, if possible, some of the points that are still controversial.

VALUE OF BACTERIOLOGIC DIAGNOSIS QUESTIONED

One of the controversial points is the relative value of bacteriologic findings in establishing the diagnosis. In successful treatment of Vincent's infection of the mouth, as in other diseases, correct diagnosis is a basic requirement. Some practitioners depend almost entirely on the smear in every case of gingivitis, and many rely on it for corroboration when the clinical diagnosis is doubtful; while still others feel that, in practically all cases, the clinical picture, including a differential diagnosis when necessary, is usually not only sufficient, but also safer than diagnosis based on a smear, which indeed they find superfluous. For them, the characteristic improvement occurring within twenty-four hours after initiation of an established procedure in treatment serves additionally as a means of diagnosis.

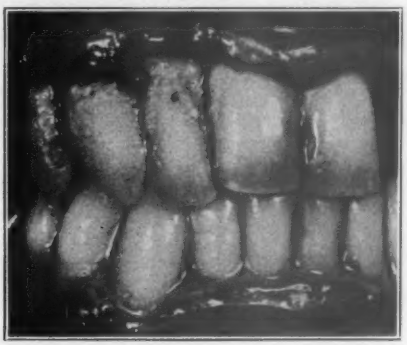

Fig. 1.—Acute destructive Vincent's infection, showing necrotic septal and marginal gingivae. In this type of the disease, the preliminary use of scalers is contraindicated except as noted in the text.

Experience shows that implicit reliance on smears for establishing a diagnosis does not give satisfactory results. For one reason, interpretation of the smear is very often erroneous. In this connection, Tunnicliff[3] says,

> Unfortunately, the diagnosis of Vincent's infection is often made on the observation of large numbers of spiral organisms, and almost any large deeply staining bacillary form. In making a diagnosis, one must keep in mind the typical picture seen in the unmixed infection and must be guided by the clinical findings. This is especially necessary in lesions around the gingivae, where a diagnosis from smears is hazardous.

Again, it is now generally accepted that Vincent organisms are frequently present in great quantities in a mouth that shows none of the characteristic clinical symptoms of the infection. In such instances, for practical purposes, we may view the presence of these bacteria, even in large numbers, not necessarily as an infection, but rather as a bacterial infestation, probably brought about by a

Fig. 2.—Subacute destructive Vincent's infection, especially marked on both sides of lower right cuspid. Of several years' duration, the infection caused deep interproximal pockets. These were tender on contact with a blunt instrument, and hemorrhage was very easily induced. In this type, frequently diagnosed erroneously as "pyorrhea," light expert instrumentation at the first sitting, followed by frequent rinsing, may be helpful in hastening resolution.

preexisting pathologic condition which invited these saprophytes.

I know of at least two instances, one in New York City and another in Oregon, in which almost the entire hospital staff, including nurses and attendants, were subjected to a series of intravenous arsphenamine injections only because of "positive" bacteriologic findings when they were examined after the appearance of a Vincent's infection in a nurse or one of the patients. Needless to say, besides being useless, such unnecessary intravenous use of an arsphenamine compound may be hazardous in the presence of an idiosyncrasy.

On the other hand, instances may be cited in which too much reliance on negative smears delayed the diagnosis and treatment of a Vincent's infection. Several such cases were referred to me after the dentist or physician, although recognizing the outstanding typical clinical symptoms, was baffled only because, for some reason, a smear was negative. That the infection was actually present was corroborated by the normal reaction to routine treatment. Evidently, in these cases, the technic of obtaining the smears was faulty, notwithstanding they were made in the laboratories of "reliable" pathologists.

Nor is it safe to depend on the Vincent organisms for corroboration of a doubtful diagnosis of concomitant oral clinical symptoms, although in extra-oral lesions the presence of the organisms is usually significant. In the mouth, they may coexist with essentially local pathologic gingival entities of either benign or malignant nature, or with oral symptoms of more or less serious systemic disease such as scurvy, diabetes, syphilis and various blood dyscrasias. Thus, we can agree with Lichtenberg when he says,

Fig. 3.—Subacute hypertrophic Vincent's infection. Non-traumatizing use of subgingival scaling at the beginning of treatment is in such a case especially desirable, since the resultant disgorgement of the hypertrophied tissue through hemorrhage seems to have an almost immediate beneficial result and facilitates rinsing.

Fig. 4.—Subacute hypertrophic Vincent's infection, less marked than that in Figure 3. In this type of the condition, often the mere use of scalers at the first sitting, followed by frequent rinsing, brings almost complete recovery within twenty-four hours.

"The value of diagnostic smears for Vincent organisms as a means of establishing a pathogenic relationship of these organisms to a suspected lesion is questioned."

On the other hand, it often happens that Vincent's infection, as a distinct clinical entity, including the typical symptoms of the disease, presents itself as superimposed on the above-mentioned systemic conditions, but even here one must depend essentially on the clinical symptoms for the differential diagnosis

rather than on the bacteriologic findings.

With all these facts demonstrating that so-called positive bacteriologic findings are not always positive nor are negative ones always negative, it is evident that the diagnosis of Vincent's infection of the mouth is best determined in most cases by the clinical symptoms, and, where there is any doubt, by a differential diagnosis, other than bacteriologic, from conditions which it may simulate.

It is to the advantage of the dental practitioner, therefore, to train himself to observe clinical variations with a critic's eye, and to study carefully the contemporary literature on this phase of the subject. He will note, among other things, that although all the symptoms attributable to Vincent organisms are usually not found in any one case, the combined evidence of certain cardinal clinical symptoms of Vincent's infection of the mouth immediately suggests the disease. They are: (1) the localization at, and focusing of the lesions from, the interdental areas; (2) easily produced or spontaneous hemorrhage from these areas, and (3) tenderness of the septal gingivae to even light manipulation with a blunt instrument. This triad usually speaks for itself, whether the condition is acute, subacute or chronic or of the destructive or hypertrophic type; also when associated with well-defined symptoms of co-existing diseases.

Fig. 5.—Chronic Vincent's infection associated with interproximal pyorrhea. The deep red of the septal gingivae, the easily produced hemorrhage and a history of occasional exacerbations suggest the diagnosis. In this type of the condition, often mistaken for a simple pyorrheal infection, traumatizing subgingival curettage tends to produce a generalized acute Vincent's infection within twenty-four hours. On the other hand, non-traumatizing instrumentation followed by frequent rinsing causes a marked improvement in a similar period.

ADVISABILITY OF SURGICAL PROCEDURES IN VINCENT'S INFECTION

Another controversial point is the matter of surgical procedure in the presence of Vincent's infection. Up to about ten years ago, there was scarcely a paper dealing with the treatment of this disease that did not stress the importance of avoiding the subgingival or even extragingival use of scalers at the beginning of treatment, or of postponing tooth extraction until after the condition had completely cleared up. There seemed to be no dissenting opinions. Since then, however, from time to time, some practitioners have maintained that scalers

Fig. 6.—Chemical burn of lining of cheek. The patient was influenced by an advertisement to use a certain preparation of sodium perborate as a mouthwash for "inflamed and bleeding gums." The lining of the lips and cheeks became a heavy mass of necrotic tissue within a few days. After use of the perborate was discontinued, the lesions healed rapidly.

may be used with impunity very early in treatment; in fact, at the first sitting. There are others who hold that tooth extraction, too, need not be postponed until after complete eradication of acute or subacute infection. This about-face, resulting in such diametrically opposite viewpoints, is likely to perplex the average practitioner planning procedure in treatment.

Granting that some operators have to the best of their knowledge been successful in extracting teeth during any stage of Vincent's infection without any untoward effects, it is nevertheless important to ascertain the findings, in this respect, of other clinicians and research workers, in order to determine whether the procedure is advisable, whether any serious results are at all possible and whether the hazard involved should not encourage caution rather than experimentation.

Fig. 7.—Form of "hairy tongue" frequently resulting from use of sodium perborate, which caused gagging and irritation of pharynx in a girl, aged 18, sensitized to action of this drug. The hypertrophied papillae were bunched up with a pair of cotton pliers in a transverse direction to show their approximate length. The cause and effect relationship between this type of "hairy tongue" and the use of sodium perborate requires no special scientific proof other than the fact that it usually appears soon after the patient begins to rinse the mouth with the drug and disappears several days after its discontinuance. (Compare Figs. 8 and 9.)

Fig. 8.—Case in Figure 7, about ten days after drug was discontinued; showing almost complete elimination of hairy appearance.

EXPERIMENTAL TRAUMATIZATION

1. Lichtenberg *et al.*,[4] after describing their work on experimental Vincent's infection in guinea-pigs, conclude that "the slightest surgical procedure, even in the presence of the mildest types of Vincent's infection is to be avoided."

2. Thompson[5] and others cite fatal cases of brain abscess from Vincent's infection following tooth extraction.

3. Farrell and McNichols[6] state that they were called in to "see three patients who were dying following the extraction of teeth in the presence of a mild Vincent's infection." They continue: "These patients had extensive ulcerations involving the rectum and genitals from which

pure cultures of the Vincent organisms were obtained. Their blood streams did not show the Vincent organisms. These patients seemed to die of toxemia and dehydration due to excessive diarrhea."

4. D. T. Smith[7] states that he was unable to produce Vincent's infection abscesses in the groins of guinea-pigs without first traumatizing the tissue.

5. Rosebury[8] remarks that, in the successful production of experimental Vincent's infection in animals by various experimenters, "the predisposing condition most frequently employed has been mechanical traumatization."

6. Kline[9] had to traumatize the muscles of his experimental animals with a hemostat in order for infection to take place after the injection, while, in the animals not so traumatized, 75 per cent showed only a small area of infiltration.

It is well known that frequently within twenty-four hours after the extraction of a tooth, even in a mouth without obvious clinical Vincent symptoms, an acute infection flares up throughout the entire mouth. This is beside the condition

Fig. 9.—Case shown in Figures 7 and 8, a year later and soon after patient resumed use of sodium perborate. As in Figure 7, the papillae were bunched up with a pair of cotton pliers to show their matlike appearance. These too disappeared shortly after the perborate was discontinued. The production and elimination of this condition at will establishes the etiology.

Fig. 10.—Unusual type of "hairy tongue" associated with unsupervised use of sodium perborate preparation, in a man, aged 34. There was a gray lesion in the center of the posterior part of the tongue which was somewhat swollen and painful. The submaxillary glands were enlarged and tender. To the naked eye, at first impression, the gray depressed patch simulated a tuberculous lesion, but on close examination under a magnifying glass, it was found to consist of a mass of small gray hypertrophied papillae interspersed with a few larger red ones, situated on the floor and sides of an extensive congenital cleft. Upon being questioned, the patient stated that he had recently begun to use sodium perborate as a mouthwash on noting slight gingival hemorrhage. He had not consulted a dentist, but was guided by the assertion in an advertisement of a perborate preparation that it could cure "bleeding gums." The patient was instructed to discontinue the use of this drug and substitute a mild alkaline wash. Within twenty-four hours, the pain was gone, and shortly thereafter the tongue and the submaxillary glands returned to normal size.

known as "dry socket" and ascribed to Vincent's organisms.

Experimental and clinical investigation shows that traumatization tends both to lower tissue resistance and to activate the organisms. The wisdom, then, of erring on the side of safety by postponing traumatization of any kind until the infection is under control becomes very apparent.

SUBGINGIVAL INSTRUMENTATION

In arguing for or against the use of scalers during the active infection, one must be careful to qualify the circumstances in each case and to consider not only the relative acuteness of the infection, but also the skill of the operator,

Fig. 11.—Mild form of edema of lip, frequently associated with use of sodium perborate as mouthwash.

and the type of instruments available. In acute conditions (Fig. 1), it seems both practical and humane to avoid scaling of teeth until after the acute symptoms have disappeared at least to a degree, because of the extreme tenderness of the tissues when exposed to manipulation with instruments and because of the possible danger of causing deep infection through the slightest traumatization. This is especially true in the destructive type where tissue resistance is obviously quite low. Scaling, therefore, might be done only partly at about the second or third visit, when the tenderness of the tissues has decreased.

However, when massive calculary deposits on exposed surfaces tend to interfere with effective rinsing, it is expedient to remove them at the first visit. This must be done expertly with appropriate instruments to avoid traumatization. If the operator is not skilful in the handling of instruments, and if the latter are of clumsy design, the patient will undoubtedly fare better if the cleansing is deferred until after the first two days. This is particularly true if, by chance, the deposits extend subgingivally. Deeper subgingival curettage is always contraindicated until after subsidence of the acute or the subacute symptoms.

Fig. 12.—Edema of lips, more marked than that in Figure 11, also produced through use of sodium perborate as mouthwash. Actual destruction of the lining of both lips may result from frequent rinsing with perborate mouth washes.

In recent years, as stated earlier, most patients present an essentially subacute condition (Figs. 2, 3 and 4). This fact, perhaps more than any other, accounts for the growing change in attitude regarding the early use of instruments. In a mild infection, expert non-traumatizing scaling can be done with a comparative degree of safety and to good advantage, even at the first sitting. The non-injurious manipulation of the edematous

gingival tissue with instruments that is incidental to the cleansing procedure tends to cause free hemorrhage, which, through the resultant healthier circulation, helps to fight the infection and markedly hastens resolution.

INJURIOUS POTENTIALITIES OF SODIUM PERBORATE

A third controversial point in the matter of treatment is the deleterious effect of sodium perborate on the mouth tissues of some persons. Of the oxygen-liberating mouthwashes used in the treatment of Vincent's infection, the most frequently prescribed are hydrogen peroxide and sodium perborate.

Since sodium perborate is used, and

Fig. 13.—Abnormal gingival condition caused by combined use of sodium perborate powder and toothpaste. The toothpaste-covered brush was dipped in the powder. There is a whitish appearance of the alveolar gingiva generally and an opaque whiteness of the marginal and septal gingivae, especially about the second bicuspid and first molar. From time to time, the mouth was so severely burned that the patient had to stay home from work. He used the drug to control "bleeding gums."

by many considered practically a specific, in the treatment of Vincent's infection, and since many persons use it as a mouthwash or dentifrice for the treatment or prevention of the disease, or to guard against its recurrence, it is necessary to attempt to reconcile the conflicting reports pertaining to the harmful potentialities of the drug, especially for certain persons.

CLINICAL OBSERVATIONS

In a paper read before this section in 1933,[10] attention was called to the fact that, either through the improper manipulation of, or a sensitization to, sodium perborate, some persons are affected adversely by its irritating or escharotic action when used as a mouthwash, or as a paste for topical application. Accordingly, a warning against its unsupervised use was deemed important. The lesions described included: (a) chemical burns of the oral mucosa; (b) a form of hairy tongue, and (c) edema of the lips. Since then, additional pathologic symptoms have been noted.

Chemical burns of the oral mucosa embracing the cheeks (Fig. 6), lips, palate, floor of the mouth, gingivae and tongue are sometimes so extensive and painful that their treatment must precede that of the Vincent's infection. The complication of the original clinical picture by these superimposed lesions often puzzles the inexperienced practitioner, and he questions the effectiveness of his treatment or doubts the correctness of the original diagnosis.

The form of "hairy tongue" referred to[10] (Figs. 7 and 9) is a benign condition that often develops within three or four days after rinsing with sodium perborate is started. It sometimes remains unnoticed altogether. On the other hand, it may become bothersome when the slimy hypertrophied filiform papillae, coming in contact with the palate, induce gagging. In rarer instances, marked enlargement and tenderness of the tongue and the submaxillary lymph nodes cause a considerable feeling of alarm. (Fig. 10.) Edema of the lips (Figs. 11 and 12) is a common byproduct of the rinsing because of prolonged retention there of the residual powder after evaporation of the water. This, however, can in most

cases be readily avoided by merely washing off the solution with plain water immediately after each rinsing.

These findings are corroborated in other articles[11, 12] as well as in a survey[13] on the subject through a questionnaire issued to the members of the American Academy of Periodontology by their committee on scientific investigation. The questionnaire was filled in by eighty-two members, and the answers indicated that all but two had had similar experiences. They furthermore listed three additional ill effects: (1) painless chemical burns producing a milky white discoloration (Fig. 13), especially of the marginal gingivae; (2) an edematous condition of the oral mucosa generally, causing it to become tender or predisposing it to ready abrasion and secondary infection through minimal traumatization, and (3) cervical hypersensitiveness.

A burn from the use of sodium perborate is evidently not limited to the oral mucosa. The vaginal mucous membrane too, according to an occasional report,[14] sustains a similar injury from swabbing with a concentrated solution of the drug for relief of fusospirochetal infection there.

FINDINGS IN AN EXPERIMENT

However, according to a recent report,[15] in an experiment on a group of young adults, such findings as the foregoing failed to materialize. To quote from the summary:

> The purpose of the investigation was to determine whether the prolonged use of sodium perborate caused chemical burns, hairy tongue or edematous conditions of the oral mucosa. . . . The experiment was conducted on 100 students, age range 19 to 30 years, who agreed to use sodium perborate faithfully twice daily as a dentifrice for six months. The teeth were brushed and the gum massaged for a period of one minute by a watch. . . . No pathologic conditions were noted which could be defined as chemical burns of the oral mucosa, hairy tongue or edema of the mucosa. . . . Flavored sodium perborate was not harmful to the oral mucosa of the experimental group when used as a dentifrice twice a day for an extended period.

It should be noted that the report made no claim that the use of the perborate, as a dentifrice or as a mouthwash, cannot cause injury. It simply states that, in their experimental group, there was no evidence of such pathologic results. However, the complete report, read casually, might give the erroneous impression that sodium perborate is innocuous and that statements as to its potentialities for harm by various clinicians are without foundation, especially since a dentifrice, supposedly stronger than a mouthwash, was used in the investigation. Nevertheless, a closer analysis of the conditions under which the experiment was carried out will account for the seeming discrepancies in the findings:

1. The perborate was used as a dentifrice twice daily for only one minute, whereas, in the treatment of Vincent's infection, it is usually employed assiduously as a mouthwash from six times a day to every half hour, the entire solution (one teaspoonful to three-quarters of a glass of water) being used at each rinsing. In the former, any irritating effect might be completely dissipated before the dentifrice was next used, while, in the latter, the time between rinsings is so short that a similar irritation may become progressively increased, since no appreciable healing can take place in the brief interims.

2. According to the replies in the Academy questionnaire, the incidence of damage associated with the use of the drug as a dentifrice was even greater than when it was used as a mouthwash. The discrepancy here is probably due to the fact that the person who uses a dentifrice as a preventive measure is likely to brush considerably longer than the one minute prescribed for the students, and more often. Clinical experience has proved that, although many people ap-

parently brush hurriedly, there are many who brush considerably more than the three minutes often prescribed, thus greatly prolonging exposure of the tissues to the chemical irritation of the drug. Moreover, some of these, as often happens, may inadvertently concentrate most of the brushing at some favored area, which therefore gets an extra period of exposure to the drug. These time variations, as well as special susceptibility, may account for the difference in reaction.

3. Since the number of persons, 100, used in the experiment is rather small, the absence of pathologic symptoms need hardly be taken as a "go" signal for the unsupervised use of sodium perborate as a dentifrice, or even as a mouthwash. It is more than likely, according to clinical observations, that, in another similar size group, as many as ten or more would be affected in one way or another. Attention has been called elsewhere[10] to the fact that approximately 20 per cent of patients cannot tolerate a greater concentration than a teaspoonful of perborate to three-fourths of a glass of water. Besides, many do not even take the trouble to measure the amount.

4. That the use of the perborate dentifrice evidently did not benefit the students materially, if at all, is implied by the statement that, during the course of the experiment, 3 per cent of the students showed "signs of Vincent's infection" and 10 per cent more showed "gingival bleeding," "gingival tenderness," "gingival inflammation due to infected retromolar flaps around partially erupted third molars" or "gingival recession." All of these could be symptoms of Vincent's infection. Its inefficiency as a dentifrice may also be deduced from the further statement that "similar conditions, including Vincent's infection, were noted in a group of fifty-three students who were not using sodium perborate." These constituted the control group.

5. In another section, the report states that "17 per cent of the students noted an improvement in their mouths." The improvement need not necessarily be credited to the use of the dentifrice; it might more readily have been due to the increased number of brushings. A survey of similar groups of students[16] shows that about 50 per cent brush the teeth on an average of only once daily, but, in the experiment, each student was required to brush the teeth twice a day. With this increase in number of brushings, such an improvement in mouths presumably not in good condition is inevitable, regardless of the dentifrice used, or even without any dentifrice, as any periodontist can testify.

That prolonged habitual use of a perborate mouthwash as a prophylactic measure may weaken the oral mucosa, thereby subjecting it to secondary infection, is well illustrated by the following case history, which should prove helpful in diagnosing similar cases:

A woman, aged 35, was anxious to avoid a recurrence of a Vincent's infection, which had been completely cleared up in record time. For more than two years thereafter, she came to the office frequently with what might be described as aphthous ulcers on the palate, the floor of the mouth and the gingivae and in the folds of the cheeks. These responded to routine treatment. Questions elicited the fact that she had rarely, if at all, suffered from such lesions before the advent of the Vincent's infection. She finally admitted that, contrary to my instructions to discontinue the perborate after completion of treatment, she had used it twice daily to prevent recurrence of the infection. The ulcers did not recur once the perborate was discontinued.

The following cases recently seen corroborate former findings that use of sodium perborate as a dentifrice can cause irritation of the oral mucosa:

A dental student observed that when he used sodium perborate as a dentifrice twice daily for any period, his mouth became "dry," with desquamation of the cheek and in the folds.

A dentist, aged 40, noted that whenever he used a perborate dentifrice, no other being at hand, the entire "inside of the mouth felt burnt."

A woman, aged 35, whose main complaint was chronic interproximal gingivitis, had been using perborate as a dentifrice several times a week for a long period, and, as a result, there was a feeling of the mouth "growing together." The patient stated that her sense of taste was affected, particularly when chewing gum, smoking cigarets and eating certain foods.

At the end of the summary, the report states that "this work is being continued." It is hoped that, in their future work, the researchers will include, as a public service, an investigation to ascertain the beneficial effects, if any, of use of perborate as a dentifrice. It is my impression that the findings would help rid the gullible public of the false sense of security into which the perborate dentifrice advertisements tend to lull them.

Finally, in evaluating the advantages and disadvantages of sodium perborate, it is important to bear in mind the following facts:

1. Notwithstanding the optimistic findings in the foregoing rather limited experiment, it is a matter of record that pathologic oral lesions can be, and often are, produced by the use of sodium perborate in mouthwash or dentifrice form.

2. Any misconception in this regard may lead to erroneous diagnosis and all that that may entail.

3. In view of the tendency in some persons to injury from the use of a sodium perborate mouthwash, its therapeutic use without supervision is inadvisable.

4. Since the preventive or curative potentialities of perborate as a dentifrice are highly questionable and have yet to be proved, and particularly because it evidently has potentialities for harm, its recommendation as a dentifrice for any reason seems unwarranted.

This discussion has been limited to some of the controversial points pertaining to the treatment of Vincent's infection of the mouth. A consideration of additional controversial topics not less important seems desirable. These should include, among others, the questions of the practicability of intravenous use of the arsenicals and whether this infection in the mouth requires dental, medical or medicodental treatment.

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CONGENITAL AND POSTOPERATIVE LOSS OF THE EAR: RECONSTRUCTION BY PROSTHETIC METHOD

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PARTIAL or total absence of the external ear is not an uncommon deformity. The disfigurement may be due to (1) developmental failure during prenatal life; (2) surgical removal of a portion or of the entire organ on account of a malignant growth, or (3) a severe injury. Of these three causes, the last is perhaps the most common. In this country, where the inhabitants are still free from the devastation of modern warfare, an injury to the ear sustained in an automobile is the most frequent cause of loss of this organ.

(It is an inescapable fact that the present war is responsible for a large number of such deformities, most of which will receive attention only after the falling of bombs and bursting of shells have ceased and man has once more settled down to peaceful activities, because in the words of the editor of the *Dental Digest*, "Modern warfare mangles the faces not only of combatants but of women and children as well. Spreading over the decades ahead will be the need to restore thousands of people who are now being butchered. In this reclamation, the dentist will play an increasingly important part.")

From the Mayo Foundation Museum of Hygiene and Medicine, Mayo Clinic.

Read before the Section on Histology, Physiology, Pathology, Bacteriology and Chemistry (Research) at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 28, 1941.

In such accidents, the external auricle, owing to its unprotected position on the head and its cartilaginous structure, is very vulnerable to destruction when, for example, the side of the head is dragged against the road or comes in contact with part of the automobile, with a shearing effect upon the ear. In the majority of cases, the organ is completely severed from the head. Often, during the excitement of such accidents, no one thinks about looking for the severed organ, which may be lying somewhere near the site of the accident. There are cases on record in which a completely severed auricle has been sutured in place with good union, but such cases are rare, for the reasons just mentioned, and the patient sooner or later will need a prosthetic restoration.

The type of deformity resulting from prenatal developmental failure takes a great variety of forms, ranging from small "aural tags" which have little, if any, resemblance to a normal external ear to fairly large "aural tags" which merely suggest an external ear. (Fig. 1.) On the whole, these "aural tags" are a hindrance rather than an aid in prosthetic restoration because they are usually in the way. There are times when it might seem desirable to remove these tags surgically before constructing a prosthesis, but such a surgical procedure is not advised unless the patient can be

assured that the prosthesis will be satisfactory. Small malformed portions of an ear, even though bearing little resemblance to an ear, are better than nothing, and surgical removal to make room for a prosthetic ear must be given proper forethought. The next alternative is, whenever possible, to utilize the parts of the malformed ear as a means of retention, making the best of the existing condition.

Deformities resulting from a malignant growth necessitating the surgical removal of a portion of or the entire ear are so varied that it is difficult to classify them. However, the destruction of an ear by this lesion results in a deformity similar to that caused by trauma. The point worth mentioning here is that removal

Fig. 1.—Two examples of congenital deformity of ear not adaptable to prosthetic reconstruction because shape definitely interferes with construction of normal-appearing ear.

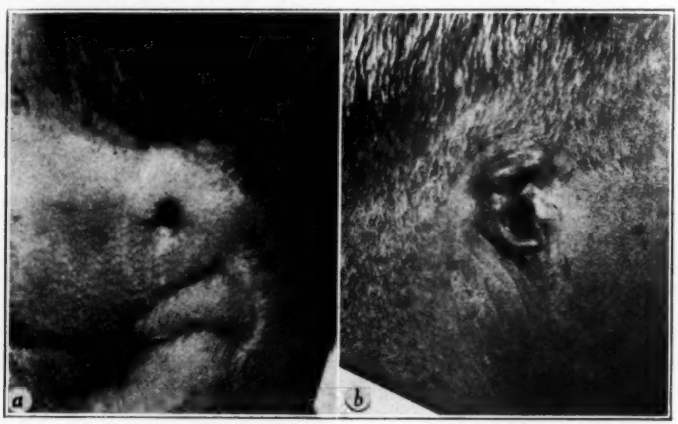

Fig. 2.—Total loss of external ear resulting in condition favorable to construction of prosthetic ear. a, large external auditory canal permitting insertion of plug to retain prosthetic ear in place. b, projections which will not interfere with construction of normal-appearing ear. The cavities will receive corresponding projections on the prosthetic ear, retention being thus assured.

of the malignant growth should be carried out with due consideration of the requirements of a possible prosthetic restoration later on.

Regardless of the cause of such deformities of the external ear, the prosthetic method offers a means of reconstruction that should be made available to every one in need of it. The dentist is the one best qualified to render this service, a service which is always greatly appreciated by those in need of it.

It is true that a certain amount of skill and experience are a prerequisite to making a prosthetic restoration about the head and face. However, aside from this fact, there is another factor which determines the degree of success in a proposed prosthesis; namely, the condition of the deformity, certain types of deformities of the ear being more adaptable to restorative work, from a cosmetic as

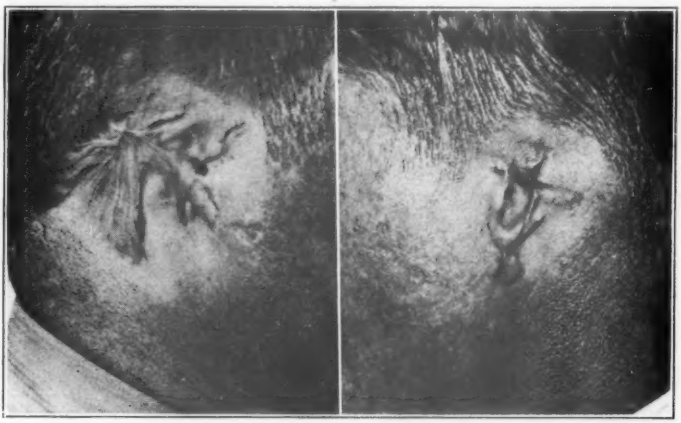

Fig. 3.—Examples of total absence of external ear with partial obliteration of opening into external auditory canal and formation of firm scar tissue at site of deformity.

Fig. 4.—a, loss of right ear as a result of trauma. b, patient wearing prosthetic ear.

well as from a retention standpoint. It therefore may be advisable to consider the various types of deformities of the external ear from the point of view of suitability for a prosthetic reconstruction.

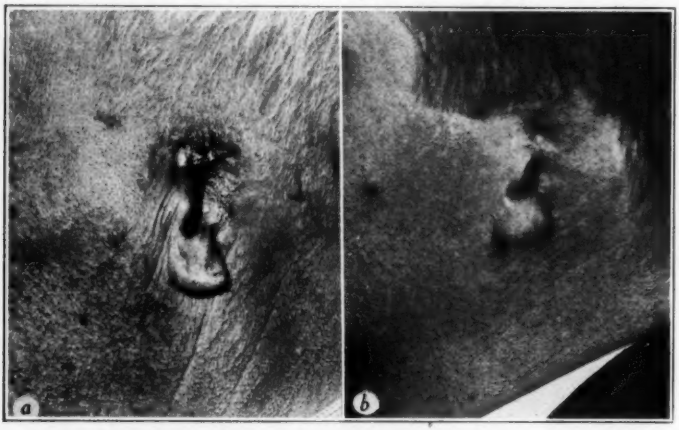

Fig. 5.—a, partial loss of ear resulting from operation. The lobule and tragus are intact. b, partial loss of ear resulting from injury. The lobule and tragus are intact.

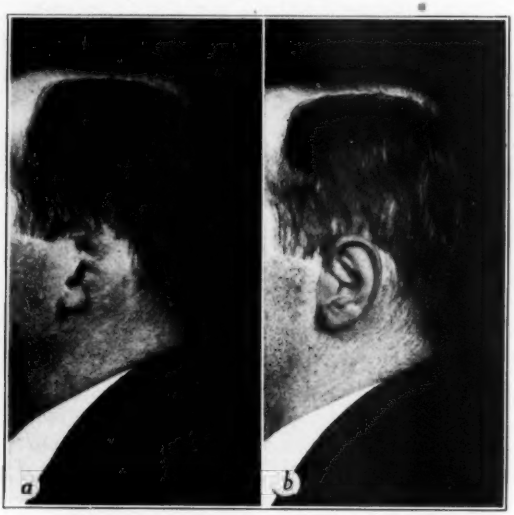

Fig. 6.—a, partial loss of ear due to trauma; b, appearance of patient with prosthetic restoration. The lobular portion of the prosthetic ear was so made as to envelop entirely the remaining natural lobule.

The most favorable condition for a prosthetic reconstruction of the missing ear is one in which the entire auricle is absent with the exception of the tragus and the deep portion of the funnel-shaped opening leading to the external auditory canal, the concha. These elements of the external ear constitute a favorable means of retention because a plug, a part of the prosthetic ear, can be made to fit the concha and its continua-

tion, the auditory canal. The presence of the tragus makes possible the junction of the prosthesis just behind this structure instead of in front of it, it thus being possible to camouflage the junction at this point. (Fig. 2.)

(Fig. 3.) In such a case, the presence of firm and irregular scars at the site of the original ear is helpful in retaining the ear in position as well as in aiding the wearer of the prosthesis in placing the artificial ear in correct position. In addi-

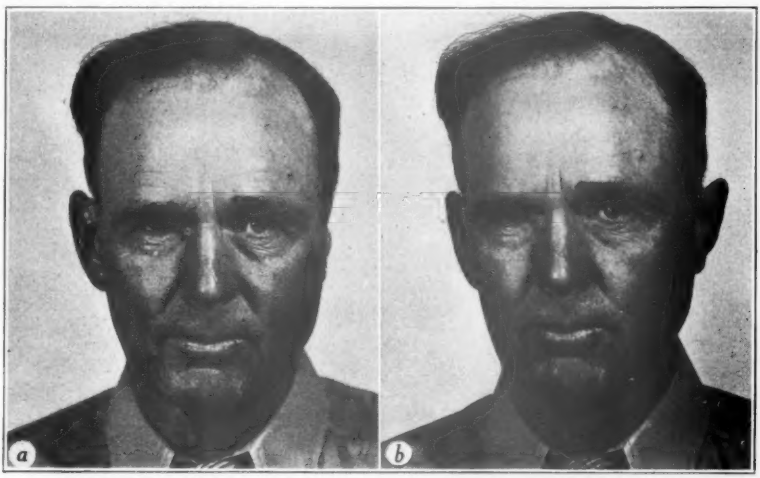

Fig. 7.—a, loss of left ear due to trauma. b, patient wearing prosthetic ear.

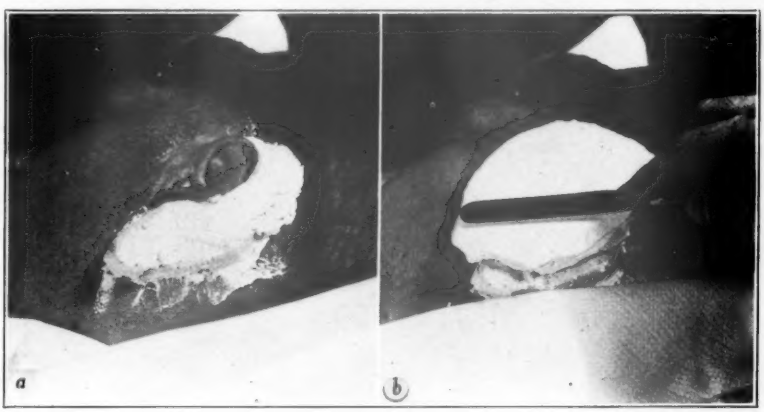

Fig. 8.—a, first step in making two-piece mold of normal ear. This part of the mold includes the back of the ear. b, second part of mold, which includes front of ear.

When the opening into the external auditory canal is partly or entirely closed during the process of healing following an injury, the problem of retention of the prosthetic ear is somewhat difficult. tion, some kind of liquid adhesive must be relied upon as the chief means of retention.

Such a condition was present in the following case.

REPORT OF CASES

CASE 1.—A man, aged 31, who first came to the Mayo Clinic June 10, 1941, had been struck by a freight train in September 1940, while driving a truck, and had been unconscious for five days. He had suffered a fractured skull, complete loss of the right ear (Fig. 4a) and injury to the right shoulder. He came to the clinic to have an artificial ear made. On the site of the ear, there was scar tissue, with some keloid formation. The right auditory canal was patent. The patient was referred for a prosthesis, June 10, which was completed June 14, as shown in Figure 4 b.

A common type of partial loss of the ear resulting from operation or trauma is one in which only the lobule remains and the tragus may be destroyed. In cases of accident, the lobule of the ear is so flexible that it has a better chance to emerge from the accident unharmed, as illustrated in Figure 5 a. Figure 5 b illustrates partial loss of the ear as a result of surgical removal of a malignant growth. In such a condition, a prosthesis can be made in one of two ways: it can come just to the lobule, or the lobule can

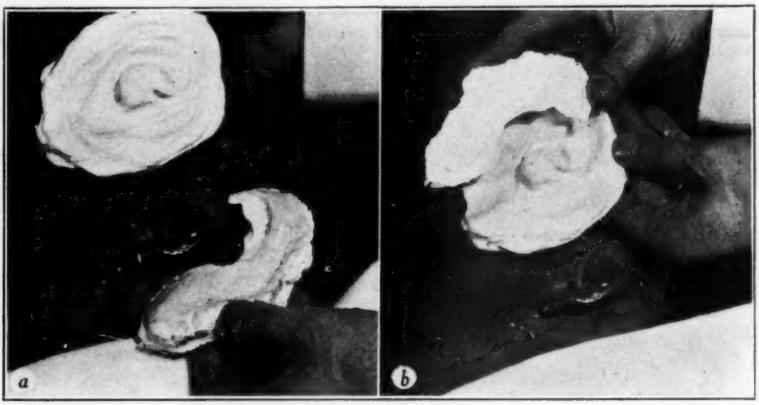

Fig. 9.—a, two sections of mold separated. b, two sections of mold assembled and pieces ready to be fitted together.

Fig. 10.—Wax pattern of proposed artificial ear placed on cast of deformity.

be entirely covered by it. The portion covering this part of the ear, of course, must be very thin, so that the lobule will not appear too bulky.

A condition of this type, in which the existing lobule was covered over by the prosthetic ear, was present in Case 2.

CASE 2.—A man, aged 33, who first came to the clinic September 5, 1941, had been struck a glancing blow by a 3,000 pound girder. The side of the head had been lacerated and the left ear had been sheared off. The ear had been found twenty minutes after the accident and a physician had sutured it in place, the sutures being removed fourteen days later. A week or two later, the ear had sloughed so badly that it had to be removed. (Fig. 6a.) On arrival at the clinic, the patient was referred for prosthesis. It will be noted that the lobe and tragus of the ear remained. It was decided to make the prosthesis cover the lobe, as shown in Figure 6 b.

CASE 3.—A man, aged 52, first came to the clinic August 25, 1941, presenting a condition similar to that of the patient in Case 2. In 1921, while roping cattle, he had become tangled in the rope and his left ear had been torn off. (Fig. 7 a.) No reconstructive operation had been attempted. His main complaint was self-consciousness about his appearance, difficulty in hearing with the left ear at times and especially difficulty in orienting sources of sounds. In this case, the prosthetic ear shown in Figure 7 b increased the ability to recognize the source of sounds and improved the appearance.

IMPRESSION OF THE NORMAL EAR OF THE OPPOSITE SIDE

While the patient is in the chair for an impression of the deformity, it is good practice to take an impression of the normal ear. A cast of this ear will be found useful (1) as an index to form and size in preparing the wax pattern of the prosthetic ear, and (2) for future use as a pattern for a prosthetic ear for other patients. In taking impressions of the normal ear, plaster of Paris or a hydrocolloidal material may be used. A good impression of the entire ear can be obtained in two pieces with plaster of Paris. A simple method of making a two-piece cast of a normal ear is illustrated in Figures 8 and 9.

The ear is divided into two regions, the back and the front. The first section of the mold to be made includes the back of the ear as shown in Figure 9 a. The thin plaster of Paris is first applied with a brush and the plaster, as it hardens, is built up to the edge of the helix, as shown. After the first part of the mold is hardened, a separating medium is applied to its exposed surface and it is made ready for the application of the top half, as shown in Figure 8 b. After this part of the mold has hardened, the two parts can be separated readily by being carefully pulled away from the ear, as shown in Figure 9 a. The mold can now be assembled (Fig. 9 b) for the pouring of a composition of wax to obtain a wax cast.

TECHNIC

The technic of making a prosthetic ear by the latex, the methyl methacrylate or any other method is identical up to the point of obtaining an accurate wax pattern for the prosthetic ear. Figure 10 shows a wax pattern that has been made over an accurate cast of the deformity. If the prosthesis is to be made of latex, the final mold has to be made so that it may be used for pouring the latex compound; but if the prosthesis is to be made of acrylic resin, the mold has to be made so that it can be flasked and the processing of the material can be carried on according to the standard method of manipulating this material.

Conversion of the wax pattern into a latex ear, as well as various methods of taking the impression of the defect, was described in an earlier paper.[1] One point worthy of mention here is that if the opening to the external auditory canal is present and if one wishes to obtain an accurate impression of this structure, it can be done best with plaster of Paris, in two parts. The first part of the impres-

sion should include the canal and the second part should include the surface adjacent to the canal, as well as the side of the face upon which the prosthesis is to rest.

It is essential that a quick-setting soluble type of plaster of Paris be carefully brushed into the canal after cotton has been packed very gently against the ear drum. The first portion of the impression is made by pouring the soluble plaster and having it project slightly upward beyond the concha. The plaster is then allowed to harden, the surface is evened with a knife or spatula and a separator is applied over it. The second and outer portion is then applied over the first portion of the impression and allowed to harden. The second part, after it has hardened sufficiently, is lifted up, the first, or canal part being left in place. The outer part of the mold will readily separate from the canal part, since a separator was applied between the two. Next, the canal part of the mold is carefully dislodged from the canal and refitted on its corresponding area on the second part of the impression. The two-piece impression is then boxed in and a hard dental plaster of Paris cast of it is made in the usual manner. The mold is separated from the cast by prying the upper part of the mold and then removing the soluble plaster of Paris from the canal part by immersion in boiling water.

It is possible to obtain an accurate impression of the canal and site of the deformity in one piece by the use of a hydrocolloidal impression material, but this presents some difficulties. It is, for example, difficult to force the warm compound into the canal without danger of injuring the ear drum, and there is also danger that the impression of the canal may be bent out of shape while it is being removed. For this reason, the former method, that is, the plaster of Paris method, is considered more reliable from the standpoint of both accuracy and safety.

THE CHOICE OF MATERIAL FOR RECONSTRUCTION

As in any prosthetic restoration about the head or face, a consideration of a prosthetic reconstruction of the ear immediately brings up the following questions: What material should be used for best cosmetic and functional results? Should a flexible or a rigid material be used? Should one aim for lifelike appearance at the expense of durability? Although the choice of material will depend to a great extent on the ability of the facial prosthetist to manipulate the material which he has selected, the decision to use a certain type of material will have a definite bearing on the type of prosthesis. Therefore, it is perhaps worth while to call attention to the qualities of two of the materials representative, respectively, of the flexible and rigid types of material.

My experience with latex, one of the flexible materials, in reconstruction in facial deformities has convinced me of the superiority of latex over any other material, but I am at the same time fully aware of the good cosmetic results that can be obtained with the new acrylic resin,[2] an example of a rigid type of material. The latter, no doubt, has the decided advantage of being very durable, so that duplicates need not be made very often, while, with a latex prosthesis, it becomes necessary to supply the patient with duplicates made from the original mold. These duplicates, however, can be made with little difficulty once the mold has been made, and if it is kept on file along with all necessary data as to coloring, etc., a duplicate can be obtained whenever needed.

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STUDY OF CARIES-FREE INDIVIDUALS: II. IS AN OPTIMUM DIET OR A REDUCED CARBOHYDRATE INTAKE REQUIRED TO ARREST DENTAL CARIES?

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INTRODUCTION

At the meeting of the American Dental Association in Cleveland, July 1940, two views were expressed[1, 2] with regard to the prevention and control of dental caries by dietary measures. While the Iowa school stresses the point of view that "dental caries can be prevented and controlled in the majority of cases if the child or individual is in a normal physiologic state and if the person in question adheres to a complete and optimum dietary program," the Michigan group believes that "the oral lactobacillus count is not reduced and caries activity is not controlled by supplementing the diet with vitamin D and minerals unless the sugar content of the diet is reduced"; and "when the sugar in the diet is restricted, the lactobacillus counts are reduced and caries activity becomes retarded with or without other dietary supplements." It was furthermore reported by the Michigan school that an unusually low caries incidence was found among groups of children on low sugar diets which were deficient in vitamins A, C and D and calcium and phosphorus.

On the surface, there seems to be an extreme divergence between these two beliefs, one that an "optimum diet" and the other that "low carbohydrate consumption" is the deciding factor. However, there may likely be little difference between these two conditions. The elimination of sweets may bring about an increased use of other foods, and, again, the inclusion of a variety of whole foods may tend to decrease the use of sweets. In fact, if one analyzes the dietary program of the Iowa school it is evident that their "optimum diet" is substantially a sugar and starch free diet, which meets the specifications of the Michigan group. It appears to us that the only difference between the two schools is in the "labeling," in that one uses the label "sugar-and-starch-free," while the other uses "optimum"; and thus they are not necessarily in conflict. In order to obtain additional data on this rather controversial subject, it was believed that a detailed qualitative and quantitative analysis of the dietary intake of a group of caries-free individuals and a contrasting group with active caries was highly desirable.

WHAT IS AN OPTIMUM DIET?

Search for a clear definition of optimum diet met with difficulties. The current

From the George Williams Hooper Foundation for Medical Research and the Division of Dental Medicine, College of Dentistry, University of California.

Conducted under grants from the California State Dental Association, the California Academy of Periodontology and the Research Board of the University of California.

Read before the Histology, Physiology, Pathology, Bacteriology and Chemistry (Research) Section at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 29, 1941.

*Deceased.

literature fails to supply either a concise definition of the term or specifications for its fulfilment. It was, therefore, decided to obtain as much information as possible from some of the outstanding nutritionists, physiologists, biologists and clinicians concerning their concept of an optimum diet. The twenty-six answers received in response to our request were at great variance. It was not surprising to learn that a large number of those replying believed that because of the incompleteness of the present knowledge of nutritional requirements, a specific formula could not be written, and even if we should arrive at a compromise suitable to all at the present time, such a conclusion could be of only temporary value and would have to be revised from time to time to accommodate current findings.

TABLE 1.—LACTOBACILLUS ACIDOPHILUS STUDIES OF 366 STUDENTS OF THE UNIVERSITY OF CALIFORNIA

Group	Lactobacillus Acidophilus Index	Number of Cases	Percentage
1. Caries-free	High	23	18.9
	Zero	99	81.1
2. Active or inactive	High	50	40.9
	Zero	72	59.0
3. Rampant caries	High	107	87.7
	Zero	15	12.3

Blayney, Bogert, Davis, Fosdick, Howe, Jay, McCollum, Price, Sherman, Sure and Walsh expressed the general point of view as to the definition and requirements of an optimum diet as follows:

An optimum diet may be defined as one upon which an organism may function with maximum biologic efficiency. However, since the term "optimum" expresses an ideal rather than anything that can yet be put into the form of a prescription, it should be used only to refer literally to the best and should not be applied to diets which are merely better than adequate. Furthermore, the concept of what constitutes an optimum diet must be ever-changing, in accordance with new discoveries in the field of nutrition and with the wide zone which exists between a state of nutrition that is merely adequate and one that is desirable or optimum. It is doubtful that a reasonable generalization can be arrived at owing to the bizarre differences in individual requirements. Nearly all discussions assume that human beings are comparable in the matter of their susceptibility to dental caries. On this basis, a nutrition that would be adequate for one would be applicable for all; but it is not so simple as this, since the diet that is adequate for one individual may not be for another. While it is known that a liberal supply of all essential factors represents a favorable condition, it is not yet possible to state for most nutritive essentials just what level of intake gives maximum health benefits, further increases possibly being needless or even detrimental. It will be apparent that recommendations for an optimum diet are merely generalizations which will vary with the observer's interpretation as to what the evidence now in hand indicates with relation to where the optimum level of life may lie for the individual in question; and since the term optimum diet carries an expression of finality, there can never be such a thing as the optimum diet and it cannot be defined now or at any other time as a diet consisting of 1 quart of milk, glass of orange juice, etc.

The difficulty in speaking of an optimum diet without full qualification of the term is expressed in a statement by Francis Scott Smyth, head of the pediatrics department of the University of California Medical School: "If human beings were as uniform in familial and inheritance characteristics as a colony of rats, an optimum diet could be reliably

appraised. As this is not the case, we are faced with a multitude of racial, hereditary, familial and climatic factors which introduce important variables; for example, the optimum diet of the Eskimo is quite unlike that of the negro in the bayous of Louisiana. While these are extreme illustrations, one may find a myriad of examples of varying tastes and digestive capacities which probably affect the utilization of diet." Thus it can be seen that, with regard to a clear definition of what constitutes an optimum diet for our own people and specifications for its fulfilment, there is considerable variation of opinion among leading authorities in the field of nutrition, physiology and biochemistry as to our ability to define the term comprehensively, much less to speak of its specific requirements.

TABLE 2.—EVALUATION OF FOOD INTAKE OF 366 STUDENTS

	Group 1 122 Individuals Caries-Free					Group 2 122 Individuals Clinically Caries-Free X-Rays Showing 4-28 Caries Areas					Group 3 122 Individuals Five or More Open Caries Areas				
	1+	2+	3+	4+	Adequacy Per Cent	1+	2+	3+	4+	Adequacy Per Cent	1+	2+	3+	4+	Adequacy Per Cent
Protein		5	15	102	94.9			6	116	98.8		1	7	114	98.2
Calcium		14	17	91	90.8		17	9	96	91.2	2	15	21	84	88.3
Phosphorus		6	14	102	94.7			8	114	98.4		2	6	114	98.0
Carotene	1	8	112	1	73.2		30	84	8	70.5		19	77	26	76.4
Thiamine	2	119	1		49.8		105	16	1	53.7		111	11		52.3
Ascorbic acid	1	12	37	72	86.9	3	27	51	41	76.6	1	15	44	62	84.2
Vitamin D			31	91	93.6		3	38	81	91.0		3	45	74	89.5
Concentrated sweets	Teaspoonfuls of sugar: 10.4					Teaspoonfuls of sugar: 11.6					Teaspoonfuls of sugar: 17.9				

IS A REDUCED CARBOHYDRATE INTAKE PERMISSIBLE FROM A STANDPOINT OF GENERAL HEALTH?

It has been stated repeatedly by the Michigan school that the prevention and control of dental caries by a reduction of *Lactobacillus acidophilus* in the oral cavity are largely dependent on a reduction of sugar alone or sugar and starch. In limiting these easily available and economical sources of energy, it is, of course, important that we be familiar with the nutritional requirements of carbohydrates, which, according to McCollum,[3] "vary according to the activity of the individual." He continues: "It is believed that the carbohydrates furnish about 60 per cent of the fuel supply of the average normal adult. The minimum amount of carbohydrates necessary for maintenance of life, and the prevention of ketosis, is from 10 to 15 per cent of the total energy requirement." This means that the average carbohydrate intake today may often be several hundred grams per day. In fact, many persons use several hundred grams each day of refined carbohydrates alone. The popular lay concept is to the effect that this amount is essential for energy and health. This view obviously is inconsistent with

the observation of patients on diabetic and ketogenic diets, whose carbohydrate intake is limited drastically without impairment of physiologic well-being. A typical diabetic diet often permits the intake of 100 gm. or less of carbohydrates per day, and such diets have long been recognized as desirable and healthful.

In exploring the still lower limits of carbohydrate exclusion possible without jeopardizing physiologic well-being, it is found that the epileptic diet may be even more extreme. Carbohydrates are often limited to 50 gm. daily and frequently to as little as from 25 to 30 gm. daily, a definite ketosis resulting. Considering that such diets are continued for months at a time with resultant good health, it must be appreciated that limitation of carbohydrates, generally speaking, is permissible.

Therefore, since it appears possible, from a medical point of view, to experience favorable health on a low carbohydrate intake, and, furthermore, since persons on a low carbohydrate intake, as, for instance, in diabetes, are observed to have a reduced caries frequency,[4] the necessity of a comparative study of the nutritional status of the caries-free and the caries-active who were comparable in other respects has become urgent.

COMPARATIVE NUTRITIONAL STUDIES OF THE CARIES-FREE AND THE CARIES-ACTIVE

1. *Selection of Material.*—For this investigation, an attempt was made to obtain large numbers of adults with or without dental caries who were comparable as to age, sex, social and educational status, etc. In many previous investigations, persons who, at the time of the clinical examination, showed no evidence of caries, have been designated as caries-immune, even though caries immunity cannot be determined by clinical examination alone. Again, in others, caries activity has been determined on the basis of the unrepaired results of destructive processes in enamel and dentin, even though, at the time of examination, the caries process might have been inactive. In order to obtain a sufficiently large number of the completely caries-free, all students who entered the University of California in Berkeley in August 1939 and 1940 were examined clinically, and those found to be caries-free

TABLE 3.—EVALUATION OF FOOD INTAKE OF CARIES-IMMUNE AND CARIES-SUSCEPTIBLE

	A Caries-Immune L. Acidophilus Negative 99 Individuals					B Caries-Susceptible L. Acidophilus Positive 107 Individuals				
	1+	2+	3+	4+	Per Cent	1+	2+	3+	4+	Per Cent
Protein	—	1	6	92	98	—	4	13	90	95.0
Calcium	1	14	13	71	89	—	11	14	82	91.6
Phosphorus	—	2	5	92	97.7	—	5	12	90	94.8
Carotene	—	18	60	21	75.7	1	6	99	1	73.3
Thiamine	—	91	8	—	52.	2	104	1	—	49.8
Ascorbic acid	1	12	37	49	84.8	1	12	33	61	86.0
Vitamin D	—	2	38	59	89.5	—	—	25	82	94.1
Concentrated sweets	10.5 teaspoonfuls					18.2 teaspoonfuls				

roentgenographed in order to be sure that no hidden cavities were overlooked. It may be interesting to note that of the large number of students who were caries-free by clinical examination, only about one-fifth were completely free according to the dental roentgenogram. By this means, 122 caries-free were obtained for this study. However, to be certain that there was no caries activity present which the foregoing examinations did not reveal, a determination of *L. acidophilus* index was made on two successive days. It was found that ninety-nine of 122 had a negative *L. acidophilus* index, while twenty-three were positive. In percentage figures, 81.1 per cent were negative and 18.9 per cent were positive. This group is designated as Group I. (Table 1.)

A second group of 122 persons (Group 2) consisted of students who had no caries on clinical examination, but showed definite evidence of enamel defects and sometimes involvement of dentin in dental roentgenograms, having from four to twenty-eight areas per person. A large number of these defects were small nicks in the enamel on the proximal surfaces, while others showed definite involvement extending well into the dentin. It was found that seventy-two students, or 59 per cent of this group, had no *L. acidophilus,* which suggests that these were caries-inactive at the time, although, at some previous time, caries must have been sufficiently active to afford roentgenographic evidence of defects. The fact that 40.9 per cent were *L. acidophilus* positive suggests an active state of caries at the time.

Finally, a third group was selected, here referred to as Group 3, which again consisted of 122 individuals who had rampant caries, with five or more open cavities evident on clinical examination. Here the *L. acidophilus* examination (Table 1) revealed the antithesis of the condition of Group I. While 12.3 per cent had negative counts, 87.7 per cent had positive.

These data, i.e., the large percentage of negative counts in the caries-free group (Group 1) and the high percentage of positive counts in the rampant caries group (Group 3), support the concept of the Michigan school and our concept that the majority of caries-free persons have no *L. acidophilus* or have insignificant counts, while the counts of persons having rampant caries are consistently high. Thus it must be recognized that the *L. acidophilus* test of saliva is important, reliable and valuable for the determination of the current dental caries status.

2. *Procedure in Evaluating Food Intake.*—It is generally recognized that the evaluation of individual food habits in the past and present by taking dietary histories is obviously subject to a wide range of error, primarily due to variation in the accuracy of recollection, integrity and honesty of the patient as well as the thoroughness and experience of the recorder, and the question arises, "Can we be sure, on the basis of present dietary histories, as extensive as they may be, that our recording and evaluating of food intake are correct?" We must recognize that we are badly in need of analytic methods of determining whether intake standards, for instance calcium and phosphorus, iron, carotene, thiamine, ascorbic acid* and vitamin D, are being met individually and whether these nutrients are actually present in the body (Christie). However, until such standards have been established, we shall have to rely more than ever upon more accurate dietary analyses, even though these have to give way to biochemical and physical methods for determining validity.

However, in view of the fact that pre-

*The terminology for the vitamins now preferred is: thiamine for B_1 and ascorbic acid for C. Carotene is mentioned as provitamin A as well as vitamin A (Morgan).

cisely objective methods were not available, a uniform procedure was developed and used in this investigation having as its aim determination of the quality and quantity of diets with regard to an "arbitrary standard level," as well as the amount of carbohydrate intake. Emphasis was placed on a personal interview with each student which was conducted by two examiners, who recorded the intake of the following popular foods:

Meat: Kind and number of servings (weight in ounces) per day or week.

Eggs: Number per day or week as such or in cooking.

Milk: Amount in glasses; also milk products, such as cheese.

Vegetables: Kind and amount, expressed in number of average servings, cooked or raw.

Fruit: Kind and amount, also considering fruit juice.

Cereal: Kind and amount, also considering cereal products.

Bread: Kind and amount, in slices per day.

Butter: Amount daily as such and in cooking.

Dessert: Kind and number of average servings per day or week.

Jam, jelly, syrup, honey: Amount in teaspoons per day or week.

Dates, figs, raisins, currants, prunes: Amounts.

Candy: Number of chocolate bars or equivalent in other candies per day or week.

Chewing gum: Sticks per day, week or month.

Soft drinks and other confections: Kind and amount per day, week or month.

Sugar: Number of teaspoons in or on food per day, not listed above.

Cod liver oil: Amount and duration of use; and duration, frequency and extent of sun exposure.

From this recording of food intake, qualitative and quantitative evaluations were made of carbohydrate as well as of other nutrients.

EVALUATION OF CARBOHYDRATE INTAKE

In the evaluation of carbohydrate intake, the teaspoon of granulated sugar was used as the unit of measure by which to express the amount contained in the diet. The approximate refined carbohydrate content of popular foods was expressed in amounts equivalent to teaspoonfuls of sugar. These values were computed from gram expressions of carbohydrate content of foods in "Food Values of Portions Commonly Used," by Bowes and Church,[5] as well as other publications giving values of popular foods.[6, 7, 8]

100 gm. sugar—20 teaspoonfuls—one-half cup—3½ ounces—400 calories

Candy: From 75 to 85 per cent sugar. Popular candy bars are likely to weigh from 1 to 5 ounces and may contain from 5 to 20 teaspoonfuls of sugar.

Hershey bar: 61 gm. in 5-cent size	7*
Chocolate creams: 13 gm. (35 to 1 pound)	2
Chocolate fudge: 30 gm. (1½ inch square, 15 to 1 pound)	4
Butterscotch: 5 gm. (1 by 1 by ¼ inch)	1
Chocolate mints: 22 gm. (1 medium, 20 to 1 pound)	3
Life Saver: 1 usual size	⅓
Chewing gum: 1-cent stick	½
Chocolate sauce: 30 gm. (1 heaping tablespoonful, thick)	4½
Marshmallow: 7.6 gm. (1 average, 60 to 1 pound)	1¼
Jam: 20 gm. (1 tablespoonful, level, or 1 heaping teaspoonful)	3
Jelly: 20 gm. (1 tablespoonful, level, or 1 heaping teaspoonful)	2½
Marmalade: 20 gm. (1 tablespoonful, level, or 1 heaping teaspoonful)	3
Syrup, maple: 20 gm. (1 tablespoonful, level, or 1 heaping teaspoonful)	2½
Honey: 20 gm. (1 tablespoonful, level, or 1 heaping teaspoonful)	3
Angel food cake: 45 gm. (1 piece, ½ of large cake)	6
Chocolate cake: 100 gm. (2 layer icing, ⅛ cake)	15
Sponge cake: 50 gm. (1/10 of average cake)	6
Cream puff (iced): 80 gm. (1 average custard-filled)	5
Doughnut (plain): 40 gm. (3 inches in	

*Figures in this column indicate number of teaspoonfuls of sugar.

diameter) 4
Macaroons: 25 gm. (1 large or 2 small) 3
Gingersnaps: 6 gm. (1 medium)..... 1
Molasses cookies: 15 gm. (3½ inches in diameter) 2
Brownies: 30 gm. (2 by 2 by ¾ inch)... 3
Custard, baked: (½ cup)..... 4
Brown Betty: 130 gm. (½ cup)..... 9
Gelatin: (½ cup)..... 4
Junket: (½ quart)..... 3
Icecream: (⅛ quart).....5-6
Water ice: (⅛ quart).....6-8
Apple pie: ⅙ medium size pie.....12
Cherry pie: ⅙ medium size pie.....14
Custard, cocoanut pie: ⅙ medium size pie 10
Raisin pie: ⅙ medium size pie.....13
Pumpkin pie: ⅙ medium size pie.....10
Chocolate, all milk: (1 cup, 5 ounces of milk) 6
Cocoa, all milk: (1 cup, 5 ounces of milk) 4
Cocomalt, all milk: (1 glass, 8 ounces of milk) 4
Eggnog, all milk: (1 glass, 8 ounces of milk) 4½
Coca Cola: 180 gm. (1 bottle, 6 ounces) 4⅓
Gingerale: 180 gm. (6-ounce glass)..... 3⅓
Peaches, canned in syrup: 100 gm. (2 halves, 1 tablespoonful of juice)..... 3½
Sweet cider: 180 gm. (6-ounces glass).. 4½
Rhubarb, stewed: 100 gm. (½ cup, sweetened) 8
Apple sauce (no sugar): 100 gm. (½ cup, scant) 2
Apple sauce (sweetened): 100 gm. (½ cup, scant) 4
Prunes, stewed, sweetened: 100 gm. (4 to 5 medium size, 2 tablespoonfuls of juice) 8
Apricots, dried: 30 gm. (4 to 6 halves).. 4
Dates, dried: 30 gm. (3 to 4, stoned)... 4½
Figs, dried: 30 gm. (1½ to 2, small).... 4
Raisins: 30 gm. (¼ cup)..... 4
Currants, dried: 30 gm. (2 tablespoonfuls) 4
Prunes, dried: 30 gm. (3 to 4, medium size) 4
Persimmons, fresh: 100 gm. (½ cup).... 7
Orange juice: 100 gm. (½ cup, scant).... 2
Fruit cocktail: 120 gm. (½ cup, scant).. 5
Pineapple juice, unsweetened: 100 gm. (½ cup, scant)..... 2⅔
Grapefruit juice, unsweetened: 100 gm. (½ cup, scant)..... 2⅛
Grape juice, commercial: 100 gm. (½ scant) 3⅔

EVALUATION OF PROTEIN, MINERALS AND VITAMINS

For the purpose of qualitative and quantitative comparison of nutritional intakes, it is, of course, necessary to have some working hypothesis. Therefore, the following nutrients were considered in this investigation on the premise that if adequate quantities were supplied from natural food sources, other nutrients would probably be present in like amounts: protein, calcium, phosphorus, carotene, thiamine, ascorbic acid and vitamin D.

A quantitative evaluation of these factors in each diet was made, using the following arbitrary standard, which was taken from the 1941 adult needs (arbitrary standards) set up by the Food and Nutrition Committee of the National Research Council:

Protein: 60-70 gm.
Calcium: 0.8 gm.
Phosphorus: 1.2 gm.
Carotene: 5,000 I.U.
Thiamine: 1.2-2.3 mg.
Ascorbic acid: 70-75 mg.
Vitamin D: When not available from sunshine, probably up to 400 I.U.

The estimate of vitamin D was based on habits of sunshine exposure as well as supplements of D concentrates, since little or none was contributed by routine food intake.

Other vitamins of the B complex than thiamine which are now well understood and for which dietary estimates may henceforth be made are riboflavin (formerly called G or B_2) and nicotinic acid. Almost as well established are pyridoxine (formerly called B_6) and pantothenic acid. From experimental work in progress, it seems that one or more of these is far more likely to be concerned in caries than any of those for which analysis is offered in this paper. This provides an interesting prospect for further investigation.

The method used to express quantitative evaluations of the nutrients in each diet is as follows:

+, up to 25 per cent of amount expressed in the foregoing standard.
++, up to 50 per cent of amount expressed in the foregoing standard.
+++, up to 75 per cent of amount expressed in the foregoing standard.
++++, up to 100 per cent of amount expressed in the foregoing standard.

Thus, a very simple summary may express an evaluation of the adequacy of each diet in supplying various nutrients as compared with a stated standard, as well as an evaluation of sweets indicated in units of measure equivalent to teaspoonfuls of sugar. Though mathematical, factual or analytical accuracy is not claimed for these evaluations, it is believed that they have comparative value since all cases here reported were recorded by the same method and evaluated qualitatively and quantitatively on the same basis.

RESULTS

With the above-mentioned shortcomings of any recording of food intake in mind, painstaking efforts were made to maintain comparative values on the data in the three contrasting groups listed in Table 1. A summary of results is given in Table 2.

In comparing the percentage adequacies of food intake of Groups 2 and 3, it becomes evident from Table 2 that there are only very small variations among the three groups for the various items protein, calcium, phosphorus, carotene, thiamine, ascorbic acid and vitamin D. In fact, the differences are so small that they can be ignored for practical purposes. No severe inadequacies in any of these important food elements appear. All three groups are comparable in satisfying nutritive requirements, which fails to explain why Group 1 remained caries-free, while Groups 2 and 3 developed caries. It appears, therefore, that the findings of the Iowa school, which led to the conclusion that an optimum diet is required for the control of dental caries, cannot be confirmed by this investigation.

It is therefore imperative to take into consideration other possible factors, in particular the carbohydrate intake of these individuals. A comparison of carbohydrates derived from such foods as vegetables, fruits and cereal products revealed no significant difference among the three contrasting groups. However, an analysis of the sugar intake as such and the sugar content of sweet foods, such as candy, desserts, jam, jelly, syrup, honey, dates, figs, raisins, currants, prunes, pastries, soft drinks and other confections, gave the following surprising results (Table 2):

Group 1: Average 10.4 teaspoonfuls of sugar daily.
Group 2: Average 11.6 teaspoonfuls of sugar daily.
Group 3: Average 17.9 teaspoonfuls of sugar daily.

This contrast between Groups 1 and 3 seems to be of significance because the individuals in the latter group consume an average of 7½ teaspoonfuls more of sugar per day than those in Group 1.

Since there was such a striking confirmation of the association of *L. acidophilus* with dental caries in that ninety-nine of 122 caries-free individuals (Group 1) had no *L. acidophilus* and 107 of 122 caries-active individuals (Group 3) had high *L. acidophilus* counts, these ninety-nine and 107 students were accepted as truly caries-immune and caries-susceptible, respectively, and were revaluated as Group A and Group B in Table 3 with regard to their dietary régime.

Here, the results of adequacy values and carbohydrate intake are similar to those of the entire group. Expressed in teaspoonfuls of sugar, the caries-suscept-

ible group (B) consumed an average of 7.7 more per day than the caries-immune group (A). Again, this appears to be the only significant difference in the food intake of these two groups.

It is interesting to observe that even though Group A was completely caries-free, a number of individuals consumed more than 10.5 teaspoonfuls per day. On the other hand, there were a number of caries-susceptible students in Group B who had less than 10.5 teaspoonfuls and developed rampant caries. The sources of these sweets were similarly distributed, among sugar, sweet desserts, chewing gum, ice cream, soft drinks, life savers and other confections. This strongly suggests that each individual may have a carbohydrate limit within which he continues free of dental caries and which, when exceeded, exposes him to the ravages of this increasingly prevalent disease.

SUMMARY AND CONCLUSIONS

Because of the great variance in concepts regarding the etiology of dental caries, especially as to the influence of nutritional conditions, a survey was undertaken to study the character of food intake of a large number of persons completely free from tooth decay in comparison with a like number having rampant caries.

For this study, 366 students of the University of California of comparable age, sex, race, environment and occupation were selected on the basis of (1) clinical dental examination with mirror and explorer, (2) roentgenographic examination of all teeth and (3) *L. acidophilus* studies of the oral cavity.

The group was divided into three groups of 122 each as to caries absence, questionable caries activity and definite caries.

By a uniform procedure, detailed dietary histories were taken of each individual at personal interviews and the adequacy of dietary intake was evaluated against a stated "arbitrary standard."

Because of the fact that definition of an optimum diet as well as specifications for its fulfilment presented great difficulties, owing to the variation in individual requirements and in concept and to incompleteness of knowledge, it is suggested that this confusing term be abandoned.

The results of this investigation can be summarized as follows:

1. *L. acidophilus* studies of the three distinct groups of 122 students each revealed that:

(a) In the completely caries-free group (Group 1), ninety-nine, or 81.1 per cent, had no *L. acidophilus* (Group 2 [C]).

(b) In 107 students, or 87.7 per cent, of the rampant caries group (Group 3), there were very high *L. acidophilus* counts.

(c) In Group 2, which included students with questionable caries activity, seventy-two, or 59.0 per cent, had no *L. acidophilus*.

2. The findings under paragraph 1 show a striking correlation between the presence and absence of *L. acidophilus* in saliva with caries activity and with freedom from caries respectively.

3. Analysis of food intake with regard to protein, calcium, phosphorus, carotene, thiamine, ascorbic acid and vitamin D of all 366 students showed clearly that these food essentials were not more deficient in the rampant caries group than in the caries-free group and not more adequate in the caries-free group than in the caries-active group. Therefore, on the basis of nutritional adequacy, or any concept of a so-called optimum diet, no one group was superior to the other, and yet one developed rampant caries, while the other remained caries-free. It appears doubtful, from these studies, that the caries incidence can be favorably influenced by increasing certain food elements so vigorously advocated currently.

4. While carbohydrates derived from

vegetables and cereal products were similar in amounts for all three groups, the refined sugars and concentrated sweets averaged for Group 1, 10.2 teaspoonfuls of sugar daily; Group 2, 11.6, and Group 3, 17.9. These values present the only striking differences in the food intake of the three contrasting groups, especially between Groups 1 and 3.

5. Because the caries-free group (Group 1) included twenty-three individuals with high *L. acidophilus* counts, and the rampant caries group (Group 3), fifteen with no *L. acidophilus*, which does not conform with our concept of caries immunity and caries susceptibility, respectively, for the purpose of this study these were eliminated from the two groups and the remainders again statistically evaluated.

The new Group A consisted of ninety-nine students who clinically and roentgenographically were found to have no caries and no *L. acidophilus*. Group B consisted of 107 students with rampant caries (clinically and roentgenographically) and high *L. acidophilus* counts. Their dietary evaluations revealed the same lack of difference, except in sugars and concentrated sweets. Here, the difference was even more pronounced. Caries-immune Group A averaged 10.5 teaspoonfuls of refined sugar and concentrated sweets, and caries-susceptible Group B, almost twice the amount, or 18.2 teaspoonfuls.

6. A number of individuals in the caries-immune group had extremely high, and a number in the caries-susceptible group very low, concentrated sweets and sugar intake. This suggests that the carbohydrate consumption alone does not explain the absence or presence of dental caries in these cases, and that other etiologic factors must be sought.

7. The similarity in the degree of adequacy of nutritional intake of these two contrasting groups fails to support the concept that a so-called optimum diet is required for the prevention of dental caries.

8. The higher concentrated sweets intake in the caries-active group, associated with a high *L. acidophilus* count and high caries incidence, indicates a direct relationship among these three factors: concentrated sweets; *L. acidophilus;* caries. Therefore, a reduced carbohydrate intake seems to be at least one means of decreasing the caries incidence and comes closer to the solution of the problem of dental caries prevention than present expressions of nutritional adequacy.

It must be realized that this investigation is based on a study of a highly selected group of American youth which constitutes approximately 1 per cent of all students examined. It is not to be overlooked that such factors as heredity, familial tendencies, environment, geographic location and possibly dietary essentials not assessed in this study may play a rôle in conferring upon this small percentage of persons an unusual resistance to dental caries. Further evaluation of these caries-free cases will be reported separately.

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FIXED BRIDGEWORK WHICH MEETS FUNCTIONAL, PHYSIOLOGIC AND ESTHETIC REQUIREMENTS

By GEORGE M. HOLLENBACK, D.D.S., Los Angeles, Calif.

THE replacement of missing teeth presents a challenge to the skill and attainment of the dental profession. History tells us that attempts were made several centuries before the Christian era to replace missing teeth by fixed appliances retained by gold bands, wires or ligatures. Some of these early appliances showed a high degree of artistry and workmanship. During the ensuing years, a great many sporadic attempts were made to construct fixed bridges, but no really worth while progress was made until the latter half of the nineteenth century.

At that time, dentistry was making rapid progress. Porcelain teeth had been successfully manufactured and were in general use. The Morrison and Richmond crowns had been invented and many dentists had become adept in making appliances of gold and platinum, fabricating them from plate by various swaging and soldering operations. While it is true that these early types of bridge restorations were wofully deficient when judged by present standards, they possessed sufficient merit to come into general use. Many of the most able dentists spent much time and effort in improving their design so that the requirements of fixed bridge prosthesis could be more adequately met. However, it has been only about three and one-half decades since this type of restoration has become sufficiently developed that the requirements of the problem have been successfully dealt with. Several things that occurred almost simultaneously were largely responsible for this.

In 1907, Taggart reduced the casting process to such a point of accuracy and simplicity that it could be generally adopted by the profession. This process enabled the dentist to work with an accuracy and precision that was well nigh impossible when older methods were used. For the first time, it became possible to reproduce tooth forms faithfully.

A short time before this, Carmichael developed the attachment that bears his name, making it possible to use anterior teeth as abutments without devitalization. Orton developed a technic whereby metal crowns meeting functional and physiologic requirements could be made. Tinker developed the cast partial veneer or three-quarter crown, which is a modified Carmichael attachment. The porcelain tipped or saddle pontic was developed soon after, and, with this pontic, the prime physiologic and functional requirements were met for the first time. The early history of this type of pontic is somewhat obscure, but it is known that Orton and Tinker had much to do with its development.

About this time, Hunter made his caustic criticism of American dentistry, alluding particularly to the sepsis and generally unhygienic conditions produced by the type of bridgework in vogue at that time. Incidentally, there was considerable justification for Hunter's contention, which caused all conscientious dentists to assume a more scientific and

Read before the Section on Partial Denture Prosthesis at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 28, 1941.

critical attitude toward restorative dentistry. Many went so far as to condemn all fixed bridgework, and a few even today will not use it. However, most of us now believe that there is a place for both fixed and removable bridgework, each of which has its own sphere of usefulness, indications and contra-indications.

In 1897, C. Edmund Kells started using the x-ray, in dental diagnosis. Strange as it may seem, the great potentialities of the x-ray in dental practice were almost entirely unappreciated for many years. During the second decade of the present century, the x-rays came into general use. Through them, much was learned of the serious pathologic results

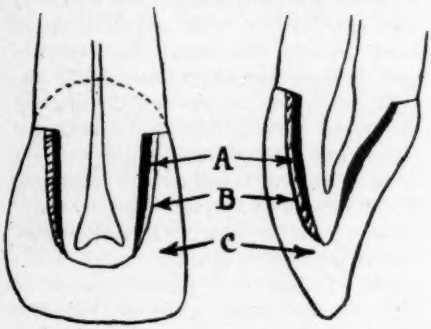

Fig. 1.—Mesiodistal and buccolingual cross-section of central incisor prepared for retention of reenforced porcelain bridge. A, iridio-platinum coping. B, layer of opaque porcelain. C, porcelain body which must be of sufficient bulk to mask layer of opaque porcelain and to secure correct shading and tooth form. In addition, there must be considerable bulk to resist occlusal stresses.

produced by the types of restorative dentistry then in use. Not only was heretofore unsuspected peridental disease, caused by ill-fitting banded crowns, discovered, but also the exceedingly serious condition following indiscriminate devitalization of abutment teeth was forcibly brought home to us all. This gave a new impetus to the development of a fixed bridge technic that would not require devitalization. At that time, all conscientious operators ceased to devitalize abutments, and it has never been found necessary to do so under any condition; that is, if there is no pathologic condition of the dental pulp.

Owing to the above-mentioned developments, the art of fixed bridge prosthesis has now reached a high degree of excellence. When the knowledge that we now possess is correctly utilized, it is possible to make bridge restorations that are very nearly ideal in the replacement of missing teeth. However, in our enthusiasm for this type of restoration, it is not altogether impossible that some of us may lose our sense of proportion and go altogether too far. This, in the long run, will react to the detriment of this excellent, but long abused type of re-

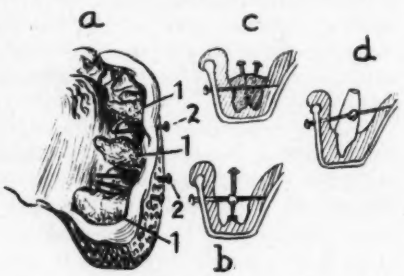

Fig. 2.—Hydrocolloid impression; steps in making working model. a, lateral half of full upper impression, showing asbestos dams isolating abutment teeth. 1, asbestos dams. 2, pins inserted through impression to retain metal segments while model is being poured. b, cross-section of abutment impression, showing method of accurately retaining small inlay retainers while low-fusing metal is being cast. c, cross-section of abutment after metal has been cast. Brads will retain metal segment in stone model. d, cross-section of impression, showing method of retaining amalgam die in correct position.

placement, and it may come about from bad judgment as to the indications for use of the fixed bridge, employment of materials which are not suitable and unnecessarily deep cutting of abutment teeth. More will be said of this later.

If the principles underlying the construction of the Orton crown, the partial

veneer or three-quarter crown, the inlay and the pin inlay are understood, abutment teeth can be prepared in such a manner that their health and vitality will not be seriously jeopardized. Every dentist who uses fixed bridgework should have a knowledge of dental anatomy and an appreciation of the mechanical and engineering principles underlying the preparation of abutment teeth so that the maximum of retention can be obtained with the minimum sacrifice of tooth tissue.

The use of materials and technics which require needlessly deep and savage cutting is a very unwise procedure and should be condemned.

Selection of proper materials for the construction of bridgework is of paramount importance. The dentist should carefully consider the requirements for each case and let the selection of materials be governed by them.

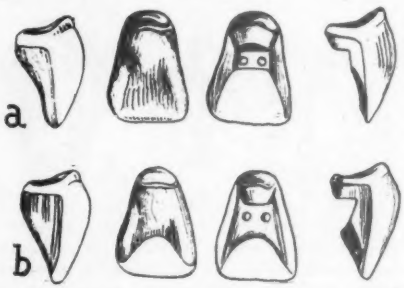

Fig. 3.—Two types of pontics. a, pontic with complete incisal protection. b, pontic with unprotected incisal surface. While this type of pontic is the best from an esthetic standpoint, an unprotected incisal edge is a distinct hazard and should be used only in carefully selected cases.

Many years ago, Dr. Black gave us the physical requirements of filling materials, dividing them into two classes, those of primary importance and those of secondary importance. The problem presented in selection of materials for bridge restorations is much more complicated than that of selecting materials for individual restorations. These requirements may be enumerated as follows:

Properties of primary importance:

1. Indestructibility in the fluids of the mouth.
2. The possession of strength to a high degree so that the various parts of the restoration will be sufficiently strong even when the bulk must necessarily be small.
3. Properties by virtue of which complicated forms and designs may be accurately produced by apparatus available to the dentist.
4. Resistance to abrasion similar to that of enamel.
5. The possession of color whereby the shading and appearance of natural teeth may be accurately and permanently reproduced.
6. Compatibility with oral tissues.

Properties of secondary importance:

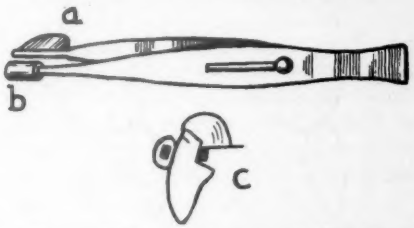

Fig. 4.—Holder for facing used for building porcelain, made from lock tweezers. a, german silver platform, hard soldered to one arm tip. b, piece of one-eighth inch rubber tubing placed over tip. c, end view with holder, with facing in position and porcelain body added.

1. Ease of manipulation.
2. Low thermal conductivity.
3. Freedom from tarnish.

The materials now being generally used in the construction of fixed bridgework are gold and its alloys, platinum and its alloys, porcelain, synthetic resins, base metal alloys, usually of the chromium cobalt type, and, to a very limited extent, silicious cements.

GOLD

Of all the materials used in the construction of bridgework, gold possesses by far the greatest number of desirable properties, and all properties of primary

importance except color. It can be readily alloyed to give any required hardness or rigidity. By heat treatment, its resistance to deformation can be greatly increased. It can easily be made into accurate and complicated forms by casting or swaging. Individual parts are readily united by soldering. Failure of any part of a restoration is easily corrected, usually without removing the entire appliance. Apparatus for manipulating gold is simple and inexpensive and is available to every dentist. Gold is very nearly the ideal material for bridgework, and there is no other material which nearly rivals it in excellence.

PORCELAIN

Porcelain possesses to a high degree three of the properties of primary importance: indestructibility in the fluid of the mouth, suitable color and compatibility with oral tissues.

Fig. 5.—Relation of facing to edentulous ridge. a, facing with ridge-lap ground before porcelain is added. The ridge-lap must be reduced sufficiently that none of the high-fusing porcelain of the facing will be exposed while the saddle is being ground to fit. b, facing with completed saddle.

Of the properties of secondary importance, it possesses two: its thermal conductivity is reasonably low and it is free from tarnish. It must be appreciated that porcelain is far from an ideal material for bridgework, yet its desirable properties are present in such a high degree, and it is so superior to all others in these regards, that it is indispensable. However, it is so wofully inadequate in some respects that attempts to subject it to uses not compatible with its physical properties are to say the least ill-advised.

BASE METAL ALLOYS

For some time, attempts have been made to use metal alloys usually of chromium cobalt composition in the construction of bridgework. In this field, it does not possess a sufficient number of desirable properties to warrant its use. The manipulation of some of these alloys requires the use of materials and devices sold only to commercial laboratories. This places the dentist in a subservient position, which is very undesirable, and for this, if for no other reason, their use should be discouraged.

SYNTHETIC RESINS

Recently, attempts have been made to use some of the newly developed resins in the construction of fixed bridgework. Materials of this type are being constantly improved and have great possibilities, yet none so far produced has physical properties warranting its use for this purpose. That being the case, they will be given no more consideration in this paper.

Fig. 6.—Porcelain faced crown. a, labiolingual view of cuspid prepared for porcelain faced gold crown. b, distolingual view of facing that has been ground from denture tooth. 7, retention fin. c, labial view of crown less facing, showing how well facing is retained and protected, yet no metal is visible.

PLATINUM

Platinum and its alloys possess much the same properties as gold and its alloys. However, it is much more expensive and more difficult to manipulate, especially by casting. Because its color is more objectionable than that of gold, it is seldom used in bridgework except for the construction of bars and grids, for the reinforcement of porcelain.

SILICIOUS CEMENT

Silicious cement has a very small field of usefulness in bridgework, possessing very few desirable properties. It may occasionally be used in veneering small but conspicuous portions of inlay abutments or in making a purely temporary repair of a broken facing. Other than this, it has no possible use in fixed bridge prosthesis.

Mention was previously made of the great importance of conservative preparation of abutment teeth. Let it again be pointed out that if a proper technic is used in the preparation, and if suitable material is used in the construction of retainers, there is no need whatever to cut abutments so extensively that their well-being and usefulness will be seriously

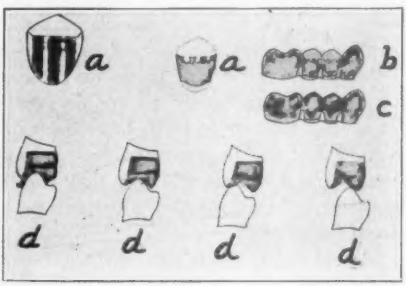

Fig. 7.—a (left), occlusal view and a (center), lingual view of pontic, showing corrugated base casting in position. b, bridge assembled. c, bridge assembled and occlusal surface waxed. d, method of chewing in occlusion in softened wax.

jeopardized. Unfortunately, a type of restoration now being generally employed in the construction of retainers utilizes a material necessitating radical and unnecessary cutting of abutments; namely, the reinforced porcelain bridge. The only reason advanced by those who use this type of restoration is that it meets esthetic requirements better than any other, and even this, in a majority of cases, is open to serious question. The mechanical difficulties encountered in construction of this type of bridgework are very real and it is almost impossible to completely overcome them. It is doubtful whether any of these restorations meet in an acceptable manner physiologic and functional requirements, and let it be stated that bridge restorations that do not adequately meet these requirements do not justify their construction, as they may well be more of a menace than a benefit.

Brief mention will now be made of the particulars wherein this type of restoration does not meet requirements.

First, the porcelain bridge requires greater destruction of abutments than any other type. Sufficient tooth structure must be removed to permit the use of an iridioplatinum coping strong enough to support the framework of the bridge. In order to prevent this coping from casting unsightly shadows, it must be covered with a layer of opaque porcelain, which in turn must be covered with a sufficient body of porcelain to restore tooth form and appearance and, at the same time, be of sufficient bulk to withstand functional stresses. Such radical cutting of abutments cannot possibly be regarded as a safe and sane procedure. Degeneration and death of the pulp are very liable to ensue. (Fig. 1.)

Second, it is extremely difficult to reproduce tooth forms and to restore functional occlusion when the porcelain pontic is used, because porcelain cannot be readily and accurately built to the required form.

Third, the points of union between the abutments and pontics must necessarily be so large that proper embrasures cannot be developed—a most serious condition and one that will almost inevitably result in severe pathologic lesions of the investing tissues of the abutments.

Fourth, it is difficult to adapt saddle areas to the mucosa and to provide the very smooth glazed surface that is so necessary.

Fifth, since porcelain does not possess sufficient strength to meet the severe stresses and strains to which bridges must inevitably be subjected, breakage is altogether too frequent, and when it does

occur, repair is impossible short of removal and reconstruction of the entire appliance.

Sixth, if esthetics, which will be dealt with later, is disregarded, reinforced porcelain bridgework has all the objections of the standard type. In other words, any criticism which can be legitimately made of fixed bridgework can be made of this type.

Seventh, from the standpoint of esthetics, the porcelain bridge is, generally speaking, not so good as the ultimate in bridges of the metal backed porcelain types, for several reasons: Owing to the difficulties encountered in the manipulation of large masses of porcelain, it is well-nigh impossible to secure accurate reproduction of shades and proper color distribution. For similar reasons, reproduction of tooth form is also very difficult. Since, owing to the weakness of the material, pontics and retainers must be united with a heavy bulk of material, it is impossible that each one be made to appear as a definite individual tooth, the result being that a bridge of this type will present a connected series of slabs displeasing to even the casual observer.

Eighth, porcelain is a very hard and wear-resisting material, presenting much greater resistance to abrasion than enamel. At the same time, it is itself very abrasive, especially after it has been ground or subjected to sufficient wear to injure its glaze. Therefore it is very destructive to natural teeth or artificial prostheses that oppose it in the dental arch.

Ninth, those who use porcelain successfully appreciate how much more difficult it is to secure the accurate fit of restorations than when other materials are used. If this is true of individual restorations, the problem becomes infinitely more difficult when two or more individual restorations must be made together, as is the case when a porcelain bridge is made. I have observed a great number of these bridges and have yet to find a single one that fitted accurately, the result being that the gingival tissues showed disease to a greater or less degree.

It is the intention of this presentation frankly to discourage the use of the reinforced porcelain bridge for the reasons which have been heretofore stated and which, in my opinion, are sufficient. The striving for esthetic restorations is truly laudable and this type of bridge is largely the result of it. It does not seem advisable to condemn this restoration without presenting an alternative.

DENTURE TEETH IN BRIDGEWORK

The manufacture of porcelain teeth has now reached a high degree of perfection. Less than five years ago, the first artificial tooth closely resembling the natural teeth from the standpoint of texture, shading and tooth form was produced. There are now several makes of similar teeth on the market, presenting such a wide variety of forms and shades as to meet practically all requirements. It is true that these teeth have been designed for use in dentures, but I have developed a technic whereby they can be successfully used in the construction of fixed bridgework.

About thirty years ago, so-called anatomic molds were produced in denture teeth and they were of much better appearance than any others then available. An attempt was made to modify these teeth for use in fixed bridgework. The lingual surfaces of the teeth being suitably ground, and the heads of the gold cased pins cut off, a pure gold backing was swaged and reinforced with gold solder as was the usual practice at that time. Several bridges were constructed in this manner. Over a period of years, nearly all failed, owing to electrolysis of the base metal pins. These bridges, however, were better from an esthetic standpoint than those made with non-anatomic facings.

About six or seven years ago, I again undertook to develop a technic for the utilization of denture teeth in bridgework. This attempt has been quite suc-

cessful, the technic involved being very simple and no more difficult than when ordinary facings are used. When this technic is used with the newer type of denture teeth, it is possible to construct bridgework so perfectly that it is almost undetectable, being much more beautiful and also much stronger and more serviceable than the reinforced porcelain bridge. This result is attained with reasonable and sane abutment preparation.

THE TECHNIC

The preparation of abutments is made in a manner to meet the requirements of the case in hand. If it is skilfully carried out, there should be virtually no display of metal. The retainers are then cast and placed on the abutments. Full impressions are now taken of both arches, with a hydrocolloid. It is much easier to use this material than any other and its use assures greater accuracy. Retainers are placed in their respective positions in the impression, and dams composed of wet asbestos fiber are used to isolate the impression of each abutment. Abutment teeth are now poured in fusible metal. It is best to insert small brads in the surface of metal to anchor it securely in the cast. The cast is now completed with "hydro-cal." (Fig. 2.)

The casts are mounted on an articulator and teeth are selected of suitable form and color. The teeth are placed in aqua regia to dissolve the pins, which usually requires two or three hours. The time may be shortened by warming the acid. All residue from the dissolved metal must be carefully removed. If the slightest bit of residue is left, it is liable to affect the color of the facing during subsequent firing. The ridge lap of the facing is ground so that the tooth will be about 0.5 mm. short and an extension is built with a 2300 porcelain body. Blending of shades 36 and 37 will produce the desired shade. The porcelain is now fired just short of a glaze. The ridge of the cast is blackened with a soft lead pencil and the saddle area is ground to fit the ridge accurately. Transfer of the graphite when the facing is tried on the model will greatly facilitate grinding.

The facing is thoroughly cleaned, placed in the furnace and fired at 2300° F. for a sufficient time to give a slight overglaze. The facing should be allowed to cool in the furnace. The lingual surface is then prepared by grinding. It is recommended that a full metallic backing be used, though it is possible to leave the incisal edge unprotected. The unprotected incisal edge will tend to improve the esthetic effect, as the natural translucency of the facing will not be destroyed. An unprotected incisal edge, however, must be regarded as a distinct hazard. As a matter of fact, with the new blending pigments of cement, it is possible to so modify the appearance of facings that one which is fully protected will be almost as beautiful as one that is not. The facings are waxed in position on the model, and a plaster core is made to retain them in position. (Figs. 4-5.)

The backings are now waxed up, using 21-gage high-fusing clasp wire, which will not disintegrate when cast to, in the pin holes. The backings are cast of suitable gold alloy. The pontics are united to retainers with gold solder. The assembly is polished and is then ready for insertion. Cement powder is mixed, with water and glycerin as the liquid. The color may be modified with blending pigments. The pink pigment will usually give a beautiful, lifelike appearance to the facing. When the correct blend has been secured, the mix is duplicated, cement liquid being used. The facings are cemented, the excess cement being removed as soon as it is set.

The bridge is now ready for cementation. The rubber dam should be used if possible, as it will be in the great majority of cases. This will greatly facilitate cleaning the abutments and seating the bridge. It will maintain dryness during setting of the cement and will be a great help in the final stripping and finishing of margins.

Occasionally, an abutment tooth will be so badly mutilated that it becomes necessary to use a porcelain-faced crown. In that case, the tooth is first roughly prepared, the rubber dam is adjusted and the gingival tissues are retracted with an Ivory No. 9 or similar clamp.

The preparation is completed, with a definite shoulder around the labial half of the tooth. The entire labial portion is prepared as for a porcelain jacket crown. The lingual portion is cut only enough to give sufficient bulk of metal for strength. A finishing line is established just below the free gingival border. The prepared tooth is now lubricated, a copper band fitted and an impression taken in modeling compound. This impression is packed with amalgam for the formation of a die. The stem or root of the die is disked smooth and slightly tapered.

The die is then accurately inserted in the hydrocolloid impression and held in place with pins and sticky wax. The case is then poured as previously described.

A suitable denture tooth is selected and the lingual surface ground to fit the amalgam die, retentive flanges being left along the mesiodistal and incisal edges. The gingival edge should be quite accurately fitted just short of the shoulder. The die and facing are lubricated and the crown is completely waxed, with the facing in position. The facing is removed from the pattern and the pattern removed from the die and cleansed for the removal of the lubricant. The recess occupied by the facing is filled level full with crystobalite investment, the remainder of the investment being made in the regular manner with a high silicate material. (Fig. 6.)

When the case is heated for casting, the excessive expansion of the crystobalite will cause a slightly loose fit of the porcelain facing, which will permit complete seating during cementation. A crown made with this technic will fit the prepared abutment better than any all porcelain crown. It does not require nearly so radical cutting, will have a beautiful tooth form and, when the facing is cemented with a suitable blend of cement, will closely rival a natural tooth in appearance.

The problems presented in posterior restorations are somewhat different from those encountered in the anterior part of the mouth. Functional occlusion is a matter of great importance, while esthetics, with the exception of the upper bicuspids, is decidedly of secondary importance.

In the replacement of upper bicuspids, cuspid denture teeth can usually be utilized in the manner previously described or, in a few cases where this is not practicable, long pin facings can be used, and, when suitable shades are not available, the entire buccal surface of the facings can be removed after completion of the bridge and replaced with low-fusing porcelain. This porcelain is made in a wide variety of shades, including pink, yellow opaque, white opaque and translucent, rendering it easily possible to secure any shading or degree of opacity or translucency which a given case may require.

A well-freed functional occlusion is of prime importance in posterior restorations. A technic will now be briefly described whereby this can be easily secured without the use of so-called anatomic articulators. If inlay abutments are used and preparations are not too complicated, wax patterns can be made and occlusion can be secured by the direct method. If partial veneer, full veneer or extensive or complicated inlay preparations are used, the semi-indirect method of pattern construction is advised, using the following technic: Impressions of the prepared abutments are taken in copper bands with elastic impression compound. When properly used, this compound can be withdrawn without distortion even when undercuts of considerable moment are presented by the contours of the tooth.

Impressions are run in "hydro-cal."

Upon separation of the impression, a beautifully accurate die will be found.

A matrix of one one-thousandths gold foil is swaged over the die and trimmed about 1 mm. short of all margins. This matrix is slightly coated with sticky wax and the pattern completely waxed on the die. This gold reinforced pattern is transferred to the abutment and the occlusion registered. The pattern is again placed on the die and carved to anatomic form. It is then invested and cast of suitable gold alloy. Retainers, whether of the partial veneer, full veneer or inlay type, when made by this technic, will fit accurately and the occlusion will require little adjusting. Full mouth impressions are now taken and casts made. These are mounted on a plain-line articulator, and suitable facings are selected and prepared in the manner previously described. This technic is a modification of the bar bridge developed by the late Forrest H. Orton, professor of crown and bridge prosthesis, College of Dentistry, University of California. I have used this modification as presented since 1927. The pontics are waxed, being left considerably short of occlusion and with heavily corrugated upper surfaces. The pontics are cast and united to the retainers with gold solder, thus completing the restoration with the exception of the occlusal surfaces of the pontics. (Fig. 7.)

The bridge is now placed in the mouth and facings are ground to free them during lateral movements. If this is carefully done, the display of metal may be kept to the minimum. The bridge is removed, the corrugated surface of the pontics are lightly coated with sticky wax, the inner surfaces of the facings are lubricated and the occlusal portion is built up with soft inlay wax. The bridge is replaced in the mouth and the wax softened, and the patient is instructed to close in centric relation and to make right lateral, left lateral and protrusive movements. The bridge is removed from the mouth and the anatomic form of the pontic is completed, with the markings given by the patient as a guide. It is a good practice to return the bridge to the mouth for a recheck. Suitable wax sprues are mounted and the case is invested, with an investment material containing metallic oxide. The case is heated and cast immediately while hot. The bridge is now polished and facings are cemented to position and tried in the mouth for checking the occlusion. If the technic has been carefully followed, little if any adjustment will be required.

Bridges constructed by this technic are comfortable because they are functionally correct. The possibility of fracture of the facings is minimized because they are ground to correct length by testing in the mouth and, at the same time, an unsightly display of metal is prevented, particularly in the upper bicuspid region, where it is so objectionable.

Since the occlusion is freed during various lateral and protrusive movements, undue stresses are eliminated, and thus the period of usefulness of the abutment teeth is greatly increased.

SUMMARY

Modern fixed bridgework has reached such a high degree of perfection that when it is properly constructed and placed where indicated, it very nearly meets the requirements of the ideal restoration. Since the conservation of the health and vitality of abutment teeth is of utmost importance, conservative preparation is necessary to attain this end, which precludes the use of technics and materials which necessitate deep and radical cutting. Gold alloys are greatly superior to any other material yet produced for bridge construction and, when properly combined with porcelain, will make a structure strong enough to withstand functional stresses and, at the same time, meet the requirements of esthetics. The physical properties of the gold alloys are such that abutment preparations can be designed to give maximum retention with minimum destruction of tooth substance.

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ORAL MANIFESTATIONS OF DIABETES MELLITUS: A STUDY OF ONE HUNDRED CASES*

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THE oral manifestations of diabetes mellitus described in the dental literature are multiple and contradictory. Since M. L. Rhein's[1] naming of the clinical entity diabetic gingivitis in 1894, through Prinz's[2] series of symptoms to Cahn's[3] disbelief in diabetic gingivitis, many mouth conditions have been linked with this systemic disease.

Prinz[2] states that the outstanding oral symptom of diabetes mellitus is a typical fruity odor from the oral cavity; the mucous membrane is deep red and extremely dry; there is a persistent dry or burning sensation and constant thirst; the teeth are coated with soft light yellowish calcareous deposits, which form very freely, and this is one of the pathognomonic symptoms of diabetes; there is increased sensitiveness about the necks of teeth; circular caries is most rampant as a sequence of the diminished flow of saliva; amalgam should not be used; a chronic gingivitis is always present; the gums are turgid, highly inflamed and bluish and bleed at the slightest irritation; neuralgiform pain on both sides of the face is always a suspicious sign of diabetes; the tongue may be enlarged and thick, showing imprints of the teeth, and it has a raw ham color, is coated and shows enlargement of the normal fissures; a mycotic stomatitis is often seen in advanced cases of diabetes; trophic ulcers of the palate appear, resulting in perforation, and with control of the output of sugar, the oral manifestations disappear.

Williams[4] noted a high incidence of pyorrhea in diabetic patients. Rosenthal[5] noted suppuration along both jaws as a characteristic feature, with acute onset and rapid loosening. Rutledge[6] showed that gingival and paradental disturbances are very frequently present between the ages of 8 and 18 years. Croftan[7] found intense congestion, fungus growths, pyogenic infection of the gums, necrosis and gangrene. Daley[8] notes that diabetic lesions give a peculiar fruity odor, chloroform-like. The tongue is somewhat enlarged and red and marginal fissures sometimes occur.

Jacobs[9] has never seen a case of diabetes without incipient or advanced pyorrhea. Hirschfeld[10] finds two definite symptoms associated with diabetes: acute gingival abscess and pedunculated proliferations or polyps that protrude from under an abnormally heavy, usually unbroken marginal gingiva. Stillman, McCall, Miller and Blass[11] note that the gingiva takes on a pasty appearance with a generalized loss of tone. A thick white purulent material exudes from the gingival margins.

Cahn,[3] though he does not believe that there is a diabetic gingivitis, observes that diabetes is frequently complicated by gingivitis and pyorrhea. J. J. Miller[12] implies that "rubber sore mouth" may be caused by diabetes. Aleman and Uleia[13] noted that vulcanite dentures were not well tolerated. Gangrenous stomatitis, thrush, herpes zoster, hyperplastic glossitis, necrosis of the jawbone, dryness and thirst were found.

Thoma[14] states that diabetes causes

*Work done under a research fellowship at Montefiore Hospital, New York City.

several distinct symptoms. The mouth may be dry and the tongue enlarged with swollen edges. The tongue may have a geographic appearance. The gingivae may be swollen, red and spongy. Calculus of a supragingival nature is usually present in abundance. It accumulates very rapidly and, if the oral hygiene is not good, it may obliterate half the surface of the teeth.

Schroff[15] notes symptoms of burning tongue when there is a rise of blood sugar. Schour[16] states that the association of pyorrhea with diabetes is generally accepted. The gums are swollen and spongy and bleed easily. Pockets form and become suppurative. Greater frequency and rapid progress of caries are reported. Miller,[17] in 1938, stated that there is no close connection between diabetes and periodontoclasia, although, in 1941,[18] he found excessive cavitation of teeth in diabetes and brownish pigmentation in bronzed diabetes.

TABLE 1.—CASE DATA

Age	Number of Cases	Male	Female
1–10	4	2	2
11–20	8	5	3
21–30	10	4	6
31–40	11	8	3
41–50	19	11	8
51–60	26	19	7
61–70	18	10	8
71–80	4	3	1
Totals	100	62	38

Ersner[19] observes that diabetes is not necessarily associated with stomatitis, gingivitis, pyorrhea or caries, but he does believe that pyorrhea is more prevalent in diabetes. Beardwood[20] found no severe pyorrhea in young diabetics. Badanes[21] noted that diabetes is not necessarily accompanied by dental caries, gingivitis or pyorrhea.

During the routine dental care of diabetic patients at Montefiore Hospital for Chronic Diseases, few of the symptoms described in the literature were observed. It was determined to obtain more definite information on the relation of the condition of the oral cavity to diabetes mellitus. One hundred patients hospitalized for diabetes mellitus and complicating diseases were studied. No definite attempt was made by the medical service to keep the blood sugar of these patients within normal limits. All dentulous patients received a fourteen-film x-ray and clinical examination, and a special diabetic chart with space for twenty-six findings was filled out in each case. Edentulous patients received the same attention, except for a ten-film x-ray survey. The following findings are herein tabulated: age, sex, duration of diabetes, severity of diabetes, stomatitis, burning mouth, ulcerated mouth, dry mouth, enlarged, geographic, smooth, coated, red, fissured, burning and painful tongue, odors, burning under dentures, circular caries, unusual tartar deposits, unusual amalgam failure and pyorrhea.

In our series of 100 patients, only twelve were under the age of 21, most of them being between 21 and 70. Of the patients examined, 62 per cent were males.

In reference to the duration of the diabetes, in most cases the disease had been present from one to ten years. Approximately one-half of the patients (52 per cent) had mild diabetes; 30 per cent had moderately severe cases, and 18 per cent had severe diabetes. Of the last, a comparatively high percentage were under 20 years of age; that is, nine of the twelve in these two age groups.

SUMMARY

While there is considerable contradiction as to the oral symptoms of diabetes mellitus in the literature quoted, the more positive, severe and distressing symptoms seem to prevail. Very little of the material quoted gave the number of cases on which the findings were based. Little of the work differentiates between untreated and so-called

treated patients, nor are they often classified according to age, sex, severity, etc.

Stomatitis.—None was found at the time of examination of any of these patients, although two gave a history of stomatitis.

Burning Mouth.—Two per cent gave subjective symptoms.

Ulcers of the Mouth.—Four per cent had ulcers or a history of ulcers of the mouth.

cent had fissures of the tongue. Twenty-one per cent of the total had only slight fissures.

Burning Tongue.—Two per cent of the patients reported occasional burning. The others did not have this symptom.

Painful Tongue.—One per cent had this symptom.

Dryness of the Mouth.—Six per cent had constant or almost constant dryness of the mouth. Twenty per cent had oc-

TABLE 2.—DURATION AND SEVERITY OF DIABETES

Years	Duration, Years 0–1	1–5	6–10	11–20	Degree Mild	Moderate	Severe
1–10	2	2	0	0	0	0	4
11–20	1	5	1	1	1	2	5
21–30	0	4	5	1	2	5	3
31–40	0	5	1	5	1	8	2
41–50	3	6	7	3	11	6	2
51–60	5	11	5	5	20	5	1
61–70	4	4	7	3	13	4	1
71–80	0	1	2	1	4	0	0
Total	15	38	28	19	52	30	18

TABLE 3.—ORAL CONDITIONS PRESENT

Age	Stomatitis	Burning	Ulcers	Almost Constant Dryness	Occasional Dryness	Rare Dryness
1–10	0	0	0	0	1	1
11–20	1	0	1	0	2	2
21–30	1	0	0	0	2	0
31–40	0	0	0	1	2	1
41–50	0	1	1	0	4	1
51–60	0	1	1	2	3	2
61–70	0	0	1	2	5	1
71–80	0	0	0	1	1	0
Total	2	2	4	6	20	8

Enlarged Tongue.—Three per cent had enlargement of the tongue.

Geographic Tongue.—Three per cent had "geographic" tongue.

Smooth Tongue.—One per cent presented this finding.

Coated Tongue.—Twenty-nine per cent had coated tongues. That this symptom is significant in chronically sick hospitalized patients is questionable.

Red Tongue.—Three per cent had red tongues.

Fissured Tongue.—Thirty-five per

casional dryness, and 8 per cent rare dryness.

Fruity, Chloroform-Like or Acetone Odor.—None was found.

Foul Odor.—Ten per cent of the patients had foul odor of the breath.

Circular Caries.—Two per cent showed unusual cervical erosion.

Unusual Tartar Deposits.—That 20 per cent showed unusual tartar deposits may be significant. Much of the tartar formation is, in my opinion, due to the greater exposure of root surface, a se-

quence to the high incidence of extensive alveolar resorption found in diabetes mellitus between the ages of 15 and 40,[22] approximately.

Unusual Amalgam Failure.—No unusual failure of amalgam restorations was found in the mouths of the diabetic patients examined.

Burning Under Dentures.—Of the 100 patients examined, 12 per cent wore one or more partial dentures, 31 per cent wore one or more full dentures and 5 per cent had fixed bridges. There was no burning present.

Pyorrhea.—The evaluation of findings under the heading of "pyorrhea" was found to be very difficult. To include gingivae presenting festoons or a loss of stippling, on the one hand, and those showing suppuration and exfoliation, on the other hand, would have classified practically all our dentulous patients as having pyorrhea. Fixott[23] showed that 80 per cent of 1,000 normal patients had roentgenologic evidence of periodontoclasia. With such a high incidence in the normal patient, pyorrhea is hardly apt to be a pathognomonic symptom of diabetes.

All of the extensively described symptoms in the literature were absent in our series. Such signs and symptoms as were found could be explained as secondary to the frequent and extensive alveolar resorption occurring between the ages of approximately 15 and 40 years in diabetic patients.[22] As shown in this previous work, the bone loss appears to be closely related to the diabetes.

The initial lesion appears to be alveolar resorption, the gingival and other conditions merely following. If, for instance, a diabetic patient had no bone loss, and this does happen, and if his hygiene is good, we would expect to find and do find normal gingivae. On the other hand, if almost all of the aveolar bone is gone and the remaining teeth are held only by soft tissue, we find the gums thick, hypertrophied and reddened,

TABLE 4.—CONDITION OF TONGUE

Age	Enlarged	Geographic	Smooth	Coated	Red	Fissured	Burning	Painful
1–10	0	0	0	0	0	0	0	0
11–20	0	0	0	0	1	1	0	0
21–30	0	0	0	1	0	1	0	0
31–40	0	2	0	4	0	6	2*	0
41–50	1	0	0	4	0	7	0	0
51–60	1	0	1	11	1	11	0	0
61–70	1	1	0	7	1	7	0	1
71–80	0	0	0	2	0	2	0	0
Total	3	3	1	29	3	35	2	1

*Occasional.

TABLE 5.—MOUTH ODOR AND OTHER ORAL CONDITIONS

Age	Fruity	Chloroform	Acetone	Foul	Circular Caries	Unusual Tartar Deposits	Burning Under Dentures	Unusual Amalgam Failures
1–10	0	0	0	0	0	1	0	0
11–20	0	0	0	0	0	1	0	0
21–30	0	0	0	1	0	1	0	0
31–40	0	0	0	1	0	2	0	0
41–50	0	0	0	2	0	5	0	0
51–60	0	0	0	4	1	4	0	0
61–70	0	0	0	2	1	5	0	0
71–80	0	0	0	0	0	1	0	0
Total	0	0	0	10	2	20	0	0

with deep pockets, gingival abscesses, pedunculated polyps, etc. These conditions are identical with those found in non-diabetic patients with similar resorption.

The unusual tartar deposits are also closely linked to the resorption. The more the root surface is exposed, the more the tartar accumulates. Inasmuch as diabetic patients have a higher incidence and a greater degree of resorption, they are apt to present corresponding findings of tartar.

The general mouth symptoms of stomatitis, burning, ulceration, dryness and an acetone odor, together with the many tongue symptoms, appear to be relics of the preinsulin era. Nearly all cases of diabetes mellitus are treated and controlled and the mouth and tongue differ little from those of the non-diabetic; nor is the reaction to amalgam restorations and dentures different.

Circular caries is a rarity in diabetic patients, as is rampant decay. The abscence of excessive carbohydrate and the presence of vegetables in the controlled diet actually seem to lessen the tendency to dental decay.

CONCLUSIONS

The so-called treated diabetic patients, who constitute practically all those with diabetes mellitus, present no oral pathognomonic symptoms other than those which may be associated with the high incidence of extensive alveolar resorption found between the ages of 15 and 40 years approximately. Such symptoms when found are similar to those in non-diabetic patients having similar alveolar resorption.

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LEUKEMIC GINGIVOPATHY: A CASE OF ACUTE LYMPHATIC ALEUKEMIC LEUKEMIA

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ORAL and dental lesions frequently mark the onset of acute leukemia and the terminal stages of chronic leukemia. The first complaint may be a simple toothache, as in the present case, followed by swelling or marked hypertrophy of the gingivae, ulceration, necrosis and even osteomyelitis of the jaw. Frequently, there is benign oozing of blood from the gums, or there may be spontaneous bleeding from the uninjured gingivae. Profuse bleeding may follow a minor injury. Uncontrolled hemorrhage may occur after a simple extraction, followed by gangrenous ulceration or noma.

Complaints referable to the mouth and teeth are so common in acute leukemia that in a large majority of cases, the patient consults a dentist before going to a physician.

In adults, acute leukemia is usually of the myelogenous or monocytic type. The acute lymphatic type is usually a disease of children, occurring but rarely in adults.

The following case of acute aleukemic lymphatic leukemia illustrates the protean character of acute leukemia and the difficulty and uncertainty of the diagnosis early in the course of the disease.

REPORT OF CASE

History.—A white man, aged 25, admitted to the U. S. Marine Hospital September 7, 1941, complaining of toothache and swelling of the face, gave an irrelevant family history. He stated that he had frequent attacks of tonsillitis and had had several attacks of quinsy. He thought that his tonsils should be removed.

September 1, the upper left lateral incisor tooth began to ache and feel sore, as if it had been struck. The four upper incisors had been denervated and filled about three years before. From then until now, the patient had had no trouble. Soon after the upper tooth became sore, the lower ones began to ache. September 5, the left side of the face was swollen and the patient consulted a dentist. The dental care consisted of cold packs to the face and, for medication, six capsules of pentobarbital sodium, 1½ grains each, and twelve tablets of acetylsalicylic acid over a period of two days. The temperature was 101° F.

Examination.—The patient was well developed and well nourished. The whole of the left cheek and the left half of the upper lip were swollen, firm, tender and warm. The teeth were in good repair and the gums normal except around the upper left lateral incisor tooth. In this region, the gingivae were swollen, pale pink, soft and tender. The tonsils were slightly enlarged and injected. Several enlarged discrete submaxillary and anterior cervical lymph nodes, about 1 cm. in diameter, were present on the left side. There were no other significant physical findings. An alveolar abscess with osteomyelitis and associated facial cellulitis was suspected.

Extra-oral roentgenograms disclosed no pathologic changes. Intra-oral ones showed radiolucent foci over the four upper incisor teeth and one the size of a pea over the left central incisor.

Treatment and Course.—The gingiva over the upper left incisor tooth was incised for drainage and a copious quantity of sanguinopurulent material escaped. An iodoform drain

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was inserted. Sulfathiazole therapy was started, but was continued for only one day, because the first blood count disclosed a marked leukopenia with agranulocytosis and a moderate secondary anemia. Transfusions, with pentnucleotid and liver extract therapy, were begun.

The gingival condition seemed to improve and the patient felt better. The temperature, which had been between 103 and 104° F., went down to 100° F. With repeated blood transfusions, the red blood cells and hemoglobin were kept at a good level, but the leukocyte picture grew worse. The hematologic findings were now suggestive of secondary aplastic anemia.

October 5, it was noted that the gingivae over all of the upper front teeth were slightly hypertrophied. The patient was getting pale

Fig. 1.—Leukemic gingivopathy.

and weaker and the temperature increased daily. October 7, the upper central and lateral incisor teeth were removed under sodium pentothal anesthesia. There was almost no operative or postoperative hemorrhage. Daily irrigation and drainage were used. The gum tissue continued to hypertrophy and a soft, exuberant, granulating, protruding mass of pale pink tissue formed that pushed the lip outward. From time to time, sequestra were removed from the wound. Small blebs appeared on the lips.

October 21, groups of enlarged lymph nodes were found in the left axilla and the left posterior triangle of the neck and bilaterally in the submaxillary and inguinal regions.

October 25, gingival hypertrophy was noted around the lower front teeth. The lips were swollen and were the site of small erosions and blebs.

Notwithstanding repeated blood transfusions, the patient became ghastly pale, the skin and mucous membranes presenting a washed-out appearance. He became very weak, being scarcely able to talk several days before death. Three days before death, he began to show mental confusion. Two days before death, he complained of pain in the left side of the chest. Roentgenograms showed areas of consolidation in the upper left lung and transverse enlargement of the cardiac shadow.

On the day before death, November 1, retinal hemorrhage was present in both eyes.

Laboratory Data.—The Blood Wassermann and Kahn tests were negative. The urine repeatedly showed albumin 2+ and many fine and coarsely granular casts. The icterus index ranged between 4 and 6. *S. suipestifer* was isolated from the blood streams. The leukocyte picture for the period in hospital is shown in the tables attached.

The red blood count ranged between 3,000,000 and 4,000,000 per cubic millimeter until near death, when it dropped to 2,500,000 with a hemoglobin of 45 per cent. The reticulocytes ranged between 0.2 and 1 per cent. Unfortunately, platelet counts were not made.

Bone marrow studies disclosed:

September 12:	Erythroblasts, 5
	Normoblasts, 2
	Myeloblasts, 10
	Promyelocytes, 21
	Myelocytes, 4
	Metamyelocytes, 5
	Bands, 4
	Polymorphonuclears, 4
	Monocytes, 11
	Lymphocytes, 14
	Unidentified cells, 15
October 25:	Monocytoid leukoblasts (probably lymphoblasts), 31
	Lymphocytes, 38
	Primitive leukoblasts (highly immature), 22
	Metamyelocytes, 5
	Normoblasts, 4

Essential Necropsy Findings.—The body was well nourished. The skin and mucous membranes were dead-white and washed out.

The upper incisor teeth were absent and the upper gums were overgrown by thick, succulent, pale exuberant granulation tissue that pushed the lip forward and protruded from the mouth. Elsewhere, the gums were thick and the teeth were submerged in the gingival tissue. The lower teeth were loose. The lymph nodes in all triangles of the neck on both sides were palpably enlarged, some more than others. There were no hemorrhagic lesions of the skin. The largest group of lymph nodes was found in the left submaxillary region. The largest nodes measured over 1 cm. in diameter. On section, the normal architecture was entirely lost and the parenchyma appeared pyoid. The nodes were soft, hemorrhagic, and discrete and as if held together only by the surrounding loose adipose tissue.

The heart weighed 480 gm. The pericardial sac contained approximately 40 cc. of blood-tinged watery fluid. The visceral and parietal pericardium was diffusely sprinkled with small flame hemorrhages. The mural and valvular endocardium showed no lesions. The muscle was soft and very pale.

The pleural cavities were about half filled with bloody fluid. The lungs were attached here and there, by means of thin fibrinous strands. The left lung weighed 710 gm; the right, 760. The upper lobe of the left lung was largely consolidated and the lower lobe showed considerable reduction in crepitation. The upper lobe of the right lung contained foci of consolidation and the middle and lower lobes showed only reduction in crepitation. Dispersions of flame hemorrhages were present over the pleura of both lungs. The upper lobes of both lungs were covered with recent fibrinous exudate. The hilar lymph nodes were large and moderately pigmented with carbon, and, on section, showed extensive pyoid transformation and foci of necrosis. On section, the parenchyma of the upper lobes showed large subpleural areas of consolidation. Some were dry and gray and others hemorrhagic.

The spleen, which weighed 700 gm., was very soft. On section, the normal architecture was entirely obliterated by mushy, structureless, grayish and hemorrhagic tissue. The splenic artery showed no pathologic alteration.

The liver, which weighed 3,000 gm., was brown and softer than normal. On section, the parenchyma was extremely friable. It was light brown, and military grayish foci were apparent throughout the organ.

The kidneys together weighed 510 gm. Small flame hemorrhages were dispersed over their surface. On section, small hemorrhages and military grayish lesions involved most of the parenchyma. The pelvic mucosa was sprinkled with miliary hemorrhages.

The mediastinal lymph nodes were moderately to markedly enlarged and hemorrhagic in appearance. The largest nests contained lymph nodes that measured more than 5 cm. in greatest diameter. On section, the parenchyma of these nodes presented a mixed hemorrhagic and pyoid appearance. The nodes were very soft and succulent. The mesenteric, lumbar and retroperitoneal nodes were prominently enlarged, soft, succulent and hemorrhagic in appearance. The inguinal and femoral nodes were moderately enlarged and presented a pyoid appearance.

Small subserous flame hemorrhages were present over the jejunum and ileum. Innumerable enlarged lymph nodes were present along the mesentric attachment of the large and small bowel, varying from a pea to a pecan in size. They were pinkish. Peyer's patches were prominently hypertrophied.

Histologic examination of the lymph nodes disclosed that the normal architecture was entirely lost. The lymphadenoid tissue was replaced by lymphoblastic cells intermingled with small lymphocytes, immature granulocytes and monocytes. Scattered small focal hemorrhages were present and occasional foci of necrosis were seen. The capsular and pericapsular tissues were extensively infiltrated by the neoplastic cells.

The splenic architecture was entirely lost and the cellular infiltration corresponded closely with that described in the lymph nodes. The trabeculae, the capsule and the walls of some blood vessels were infiltrated by neoplastic cells. Capsular and pulp hemorrhages were present.

The liver showed extensive dense periportal infiltrations of lymphoblasts. The lungs presented areas of pneumonic consolidation and areas of dense lymphoblastic infiltration. The neoplastic areas showed various degrees of necrosis. Emboli and thrombi of tumor cells were present in some of the larger blood vessels. The kidneys showed extensive interstitial and periglomer-

LEUKOCYTE PICTURE FOR PERIOD IN HOSPITAL

Date	Leukocytes	Lymphocytes	Monocytes	Eosinophils	Segmented Neutrophils	Bands	Metamyelocytes	Immature Leukocytes
9/8/41	1,200	84	6		2	8		
9/8/41	1,200	90	2		2	2		Blasts—4
9/9/41	1,100	82	8		2	8		
9/10/41	900	92	4		2	2		
9/11/41	800	82	11		2	5		
9/12/41	850	84	11		2	3		
9/13/41	1,100	74	6		2	14	4	
9/14/41	1,225							
9/15/41	1,500	93	4	2		1		
9/16/41	1,800	95	4			1		
9/17/41	1,500	88	5		4	2		
9/18/41	1,500	95	3		1	1		
9/19/41	1,400	91	4		3	2		
9/20/41	1,700							
9/22/41	1,870	89			2	9		
9/23/41	1,950	86	0		14			
9/24/41	1,740	94	2		4			
9/25/41	1,925							
9/29/41	1,600	94	5	0	0	1		
10/4/41	1,850	97	2		1			
10/7/41	2 000	89	6		4	1		
10/9/41	2,000	96	4		0			
10/10/41	1,500	99			1			
10/13/41	3,200	91	1		2	2		
10/14/41	2,700	94	1	1	2	2		
10/15/41	2,600	56		1	3			
10/17/41	3,000	85	5		3			Blasts—7
10/18/41	2,800	94	5		1			
10/20/41	2,750	92	5		1			Blasts—2
10/21/41	2,600	88	7		3			Blasts—2
10/22/41	2,600	80	5		9			Blasts—6
10/23/41	3,050	86	13		0	1		
10/23/41	2,600	88	12					
10/24/41	6,500	62	3		1			Primitive leukoblasts 6 Leukoblasts (probably lymphoid) 28
10/26/41	6,100	38						Leukoblasts (lymphoid) 48 Blasts (immature) 14
10/27/41	8,900	50	2					Leukoblasts (lymphoid) 25 Leukoblasts (primitive) 23
10/28/41	23,700	21						Leukoblasts (primitive) 17 Leukoblasts (lymphoid) 52 Myelocytes 6 Promyelocytes 4
10/29/41	60,000	19	3					Leukoblasts (lymphoid) 54 Primitive forms 8 Myelocytes 6 Promyelocytes 10
10/30/41 (9 a.m.)	34,000	52	10					Leukoblasts (lymphoid) 25 Primitive forms 4 Myelocytes 3 Promyelocytes 6
10/30/41 (3 p.m.)	16,350							
10/31/41	22,500	13	2					Leukoblasts (lymphoid) 42 Monoblasts 2 Myeloblasts 22 Myelocytes 14 Promyelocytes 5

ular infiltrations of lymphoblastic cells and scattered focal hemorrhages. Throughout the cortex of the adrenal glands, focal infiltrations of neoplastic cells were present. The epicardium, myocardium and endocardium showed widely dispersed focal areas of hemorrhage and dense infiltration of lymphoblastic cells. The pancreas, prostate gland and urinary bladder showed extensive focal and diffuse infiltration of lymphoblastic cells. The adventitia of the aorta contained infiltrated neoplastic cells. Specimens of the granulating gum tissue showed rich capillary vascularization and dense infiltration by lymphoblastic cells.

DISCUSSION

The clinical diagnosis of acute leukemia may be very difficult. There is no diagnostic procedure by which it can be determined with certainty early in the course of the disease whether a patient is suffering from acute leukemia, a septic infection or a hemorrhagic diathesis.

Clinically, oral lesions are important in acute leukemia, not only because they occur in a high percentage of cases, but also because they are very often the earliest manifestations of the disease. The lesions may involve only the gingival tissues at first and then the oral mucous membranes.

Forkner[2] and others have emphasized the observation that diffuse swelling of the gingivae, with ulceration, necrosis and a tendency for the teeth to become submerged in the gums, is characteristic of acute monocytic leukemia. However, this is not pathognomonic, for it is well recognized that similar gingival lesions frequently occur in other types of leukemia.

The presence of Vincent's microorganisms and other bacteria does not preclude the presence of leukemia, and it should not distract one from the underlying cause. Infection may be either concurrent or a complication of the disease. In the present case, *S. suipestifer* was isolated from the blood stream.

The clinical course and all laboratory studies may be misleading. Routine blood studies may not disclose the true condition until late in the disease.

It is not sufficiently appreciated that acute leukemia is often associated with marked leukopenia and agranulocytosis. There may be marked daily fluctuation in the number of leukocytes. Only a few hundred cells may be present in any phase of the disease. Because of this fact, in many cases, diagnosed as agranulocytosis later, death was due to leukemia. Regardless of the total number of leukocytes, the most reliable criterion for diagnosis of acute leukemia is the presence of a sufficient number of immature cells.

The accepted description of the clinical features of acute leukemia does not include all cases. Indeed, "atypical" forms are the most common. There are no constant clinical differences among the myeloid, lymphatic and monocytic cases.

Acute leukemia is most frequently confused with acute agranulocytosis, aplastic anemia, Vincent's infection, thrombocytopenic purpura, infectious mononucleosis and acute sepsis.

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PUBLIC DENTAL HEALTH IN DENTAL EDUCATION

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IN presenting a brief appraisal of present-day dental education, it is a pleasure to note that many of the essential principles and objectives for dental schools comprehended by the founders have, at last, been achieved. Of course, in the long journey that we have traveled "we have cast aside numerous idols and comforting fictions." We have overcome some old dilemmas and "formed the habit of questioning all things." We have become capable of self-criticism and attained an urbanity of spirit. With civilized resignation, we have learned that we may not possess finality in matters of truth and right, and that a man "must order his life according to the wisest discrimination of value of which he is capable." In a short paper, one can refer to only a few of the means by which present-day dental education can be assured of continued progress in its second century and thus contribute to the advancement of public dental health.

University affiliation of dental schools has become a reality, and in the United States very few schools now remain which are not integral divisions of a university. This definite principle will doubtless be retained and extended, because it has been very helpful in improving the quality and scope of the courses now taught to dental students. As our knowledge and understanding of oral diseases and their implications have been enlarged, it has become increasingly obvious that the scientific background and professional training of the dentist should follow very closely the pattern provided for the student of medicine and surgery.

As dentistry continues to advance as a health service, it seems reasonable that the profession will expand the principle that dental care is essential to the health of mankind. Hence, it should be eager to add its contribution to our growing public-health programs. The widespread lack of dental services for the masses may some day lead to the conviction that they too have a just claim on the benefits of modern dental treatment. It is well to remember that the laws of our states which regulate the practice of dentistry were initiated by the profession, and usually on the basis that the laws would protect the people as well as the profession. These laws are proof also of our own inner discipline, which is characteristic of all professions, and without which a vocation cannot win true professional status.

If we would deal soundly and broadly with the facts now in our possession (e.g., the prevalence, incidence and implications of oral diseases) and with a sincere regard for the relation of these facts to the wellbeing of man, we should make every effort to aid our people in planning adequate dental care.

In conformity with these concepts, some dental schools now offer superior instruction not only in the basic sciences, but also in the principles and methods of public health, so that their graduates will regard the practice of dentistry primarily as a health service and not merely

Read at the Fifth Annual Meeting of the American Association of Public Health Dentists, Houston, Texas, October 26, 1941.

as a vocation which provides the means for making a living.

The dental student of today, at least in some schools, is informed regarding community health problems and the progress that has been made in recent years in general hygiene and the extension of medical care. He is better qualified than graduates of a decade ago to cooperate with public health agencies already established and in the health problems that have not been solved. He receives instruction in the methods employed for dealing with community health, and, in lending his aid after graduation, he knows that he will not sacrifice any of his broad professional interest and that his participation in public health projects will not affect adversely any of the profession's objectives. He has learned that a progressive profession which is conscious of society's problems and needs, and has its plans for solving them, need not fear unreasonable encroachment upon its domain. In this connection, it is well to recall that many of the important advances in modern life are the product of cooperative efforts, of our consciousness of obligations to the social order, and that seclusion and an attitude of self-sufficiency seldom solve our common difficulties.

The curative methods of dentistry and the teaching of these to dental students have reached the highest level of effectiveness in our history; and while we cannot now foresee a future when we may safely discard these methods, the prevention of dental ills has become an important theme in all of our discussions. To be sure, in practice we have to resort to reparative methods because our knowledge of prevention is inadequate; but, in education, a growing number contend that if dentistry would continue to advance as a profession, it must accept prevention as a dominant objective.

If this next step in dental education is to materialize, a better understanding of the causes of oral diseases than we now possess will be required. This deeper insight cannot be acquired without painstaking research. To prosecute this research, our dental schools must have more and better facilities, and a larger, well-qualified personnel.

Recent progress in several divisions of medicine and surgery points the way in which such advances in dentistry may be achieved. Unfortunately, such good and worthy attainments are expensive, and the necessary funds for promoting such an advance have always been too meager, or entirely lacking. All groups and associations concerned with dental education and the extension of dental service should, therefore, seek generous financial support for our dental schools. We must encourage capable young people entering the profession to take up teaching and research as a full-time vocation, one with which they will gladly be identified for life. An effective way of doing this is to pay them adequate salaries. We must not forget that all professional education is relatively expensive, and that the training and education of scientific dentists are no exception.

Standards of present-day dental education are much higher than formerly. New courses have been added to the dental curriculum and the basic training courses of former days have been improved. The dissemination of knowledge of the prevalence and incidence of oral diseases, of the effect of denture mutilations and anomalies, has been characteristic of our common efforts for over a decade. In addition, many dental societies have carried on educational campaigns by utilizing many forms of publicity. Nevertheless, the more general use of dental care by the masses has not kept pace with our technical progress. Many members of the profession believe that our objectives have not changed sufficiently and that our students are still trained, primarily, in the technic of the art of dentistry. This brings me to another division of our subject; namely,

how may we extend and expand dental public health?

During the last three years, Washington University School of Dentistry has offered to its senior students an obligatory course on community health problems, which is given once a week for the entire year and in which the following subjects are studied:

Federal, state and municipal health agencies.
Maternal and child hygiene.
Principles of personal and social hygiene.
Nutrition and deficiency diseases.
Epidemiology of Vincent's infection.
Dental health education.
Water supply and water treatment.
Sewage and stream pollution.
Public health nursing.
Problems of child welfare and management.
Communicable disease control.
Basic principles of epidemiology.
Principles of public health administration.
Organization and functions of local public health councils.
Prenatal care.
Food infections and poisoning.
Hygiene of preschool and school children.
Child growth and development.
Mental hygiene.
Statistics.

This course, virtually the course offered to our junior medical students, is made available through the facilities of the university. Heretofore, it has been given separately, because of schedule conflicts, but, in the future, it is hoped that these conflicts can be adjusted and that dental and medical students will take the course simultaneously. The subjects require from one to five class hours each. I mention this as evidence of the value of university integration of dental education.

For many years, I have been one of that group which believes that there can be no great profession without fine schools, and that fine dental schools are impossible without ample funds in addition to the normal, legitimate income received from tuition and clinic fees. I firmly believe that a worthy and important objective of all dental schools in the future will be sufficient income for each to allow them to set up clinic fees that will be not more than cost (preferably less), and that their services will be strictly limited to the indigent. Endowment income and, in the case of state-owned institutions, tax income should support our college clinics of the future, so that all indigent patients will receive the service that they need (based on a complete diagnosis), and not merely the "blood and rubber dentistry" that they have all too frequently had to accept.

In such a school clinic, where each dental chair is not required to earn a minimum income per year (a practice which was prevalent in the days of proprietary schools), the student of the future will draw different conclusions from the patients assigned to him. The number, kind and quality of restorations and treatments can still be recorded on his clinic record, but his clinic "turnover" will not be a major criterion. Class conferences for case reports will stress other factors, such as the etiology, diagnosis and prognosis of lesions or diseases. These may with profit be discussed in class.

These changes in educational procedure need not, and must not, impose a lowering of the standards in operative skill, which we acquired during the last century by developing curative methods. As I contemplate the future of dental education, I like to believe that these changes will foster an acceptance by the student, and therefore by the profession, of the fact that he is preparing himself as a member of a learned profession, a profession that is not oblivious to its social responsibilities, for a service which the public needs badly, though it does not now realize it, and which the public will eventually support in increasing measure, because its ministrants are motivated by an altruistic devotion and a noble esteem of their work.

In the years to come, the profession will adopt "prevention as a public good" and the individual member will thus retain his interest in his obligations to society, which already protects his domain by law.

But this is not enough. Much more needs to be done to bring to fruition the ideal of dental public health—the prevention of oral diseases, anomalies and mutilation. In conclusion, I wish briefly to indicate two ways of dental education by which we may promote public dental health:

1. An educational program for the people. This has, of course, been carried on for many years, but the profession's attitude on prevention and the extension of means for dental care of the general population has not changed with our knowledge of needs and the evolution of our objectives. Dental public health organizations must continue to extend their spheres of influence, and it might be well if they would include dental schools in their fields of operation. Allen O. Gruebbel, of the Missouri State Board of Health, in a recent paper on "Utilizing Our Available Resources in the Dental Health Program,"[1] has analyzed the most effective means by which the laity may be informed and a demand for dental service be increased. Study and analysis of programs for the masses should, of course, be included in every course on community health problems for undergraduate dental students. Continuance of these studies in our dental schools for a period of years will undoubtedly increase the interest of the profession in its social responsibilities.

2. Extension of dental service to the people. Adequate dental care of the masses has largely remained an ideal, although our knowledge of oral disease demands that consideration of the mouth and teeth be included in every complete health service. We realize that complete dental service for all the people is financially and physically impossible; that a dental health program for any community must, for the present, be largely based on prevention, and that concentration on adequate dental care of children promises the greatest good. In extending even this limited service, it is becoming clearer that, in all our larger centers of population, dental clinics will have to be provided. As we extend this dental service to the child population, it would be a grave error not to utilize the already existing dental school clinics as a nucleus upon which the larger program of dental public health will be built. Their facilities and personnel should be drafted into the larger program of dental public health, not only because it would be more economical, but also because of the educational values and opportunities which would be added to undergraduate dental education.

Courses in dental surgery and dental prosthetics which, under existing conditions, are imperative, provide training, primarily, in reparative methods. These two divisions of dental school clinics are also allotted most of the clock hours set aside in the curriculum for clinic practice. A favorite argument for continuing this routine is: "Our graduates must be taught how to earn a living."

Dental medicine, which regards most dental lesions as manifestations of disease and seeks for causes, and dental pediatrics, which concentrates on oral disease of the child patient, are vitally concerned not only with remedies and procedures of value after the lesions have occurred, but also with preventive measures. The preclinical signs of oral lesions may be many, but we have hardly begun to regard them as worthy of our interest and study.

The St. Louis Dental Society's analysis of the oral conditions of more than 119,000 St. Louis school children revealed that 51.4 per cent of those ex-

1. GRUEBBEL, A. O.: *Washington Univ. D. J.*, 8:1-8, August-November 1941.

amined had dental anomalies. This prevalence of oral deformities is surpassed only by that of dental caries. The records of the University of Minnesota School of Dentistry show that total loss of teeth, for which dental prosthetics has developed such excellent methods of care, does not equal the prevalence of dental anomalies until the sixth decade of life. One may well ask: What is the aim of dentistry? Must it remain a reparative art of which it will forever be said "too little and too late"? Or can prevention become its main objective? And, if so, should not the undergraduate curriculum offer ample opportunities to the student to master the data and methods of maintaining dental health? Public dental health associations such as yours are accumulating much valuable information that will help to modify dental education of the future. Your sympathetic cooperation with dental schools may become a fundamental factor in molding the new dentistry which lies ahead.

DIAGNOSIS AND CORRECTION OF PATHOLOGIC OCCLUSION

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IT is not the object of this presentation to stress unduly the occlusal factor of periodontal disease. We start with the premise that there are three etiologic factors to be considered in its diagnosis, treatment and prevention. The systemic factor embraces nutrition, metabolism and general health, and is the fundamental basis of oral and dental health or ill-health. The periodontal factor embraces all gingival and periodontal impingements and irritants, and thus includes faulty home care by the patient, inadequate scaling and polishing by the dentist, overhanging margins of fillings and the host of possible bacterial, chemical and mechanical irritants of the periodontal tissues themselves. The third factor is that of occlusion, the delivery to the teeth, and through them to the periodontium, of the burden of muscular force used in mastication and in countless non-masticatory closures of the jaws.

Occlusal force has been variously estimated and measured. To speak broadly, it averages from 75 to 100 pounds when there is a full complement of natural teeth. When some teeth are missing and have been replaced with artificial ones, the force applied is less, because of some instinctive tendency on the patient's part to temper the wind to the shorn lamb. This force is applied constantly during mastication, which totals perhaps fifteen or twenty minutes during twenty-four hours, and in various non-masticatory closures, including those accessory to swallowing, at the estimated rate of twice a minute during waking hours and once a minute during sleep.

Thus, it is seen that the dentures are not to be considered as individual teeth at rest, but as a constantly moving machine. When this machine is properly set up by the hereditary and environmental development of the individual, occlusal force is distributed to two rows of posterior teeth, one on each side of the mouth, during all jaw movements within the masticatory range. As the mandibular denture is dragged across the maxillary, each cusp and ridge of one

Read before the Section on Periodontia of the American Dental Association.

denture cooperates with an opponent in the other jaw to produce the large number of shearing contacts which make of the dentures a multibladed shearing machine. Under such conditions, masticatory function is optimum and the biochemical processes that constitute life are receiving the oral assistance nature meant them to have. General health, other things being equal, will be of the best, and the general health factor will cooperate with the occlusal factor of equitable force distribution to produce a beneficent circle in which the periodontal tissues are maintained in optimum health.

Unfortunately, environmental conditions during childhood often tend to prevent that harmony between the teeth and the movements of the temporomandibular joints necessary to produce the perfect masticating machine. Deficiencies of prenatal and postnatal diet and of endocrine function may start the child off in life with defective mineralization, with soft bones and teeth and anomalies of tooth form and size. The fine balance of muscular pressure under which the growing dentures assume form and their position in the jaws may be upset by mouth breathing and thumb, lip or tongue sucking. The soft, growing bones may be malformed from the weight of the head, if the child is accustomed to sleeping on his face or habitually leaning chin on hand. Properly formed and well dimensioned teeth may thus be placed in positions which render them unable to cooperate during the movements of the jaw, and conflict rather than cooperation between opposing teeth will be the result. Such an occlusion is pathologic from a twofold standpoint, since it induces or encourages pathosis of the periodontium supporting the conflicting teeth, and, at the same time, may cause general ill-health through masticatory inability. Competent research has not yet been undertaken to prove the importance of mastication to general health, longevity and resistance to infection and disease, but the experience of those who raise domestic and dairy animals points to the importance of the masticatory function.

When a few teeth are called upon to do the work of many, as they are in antagonistic or pathologic occlusion, they must receive, and pass on to the periodontium, the burden of perhaps 100 pounds of occlusal force, constantly applied. The periodontium must resist with equal pressure. Since all activities of living matter deplete it chemically, there must be constant renewal by the intake, digestion and utilization of food. It is logical to assume that the overworking of bone demands an increased renewal of mineral constituents. Bone is a sluggish tissue, having few cells and a great deal of intercellular material. Often, the cells must be nourished by diffusion as against the facile nourishment of most cell protoplasm by dialysis through the plasma wall of the cell. Bone, more than other tissues, is apt to prove unable to rise to the exigencies of excessive functional demands, with the result that it wastes away, with the periodontal resorption characteristic of periodontosis (periodontal pathosis), and, at the same time, exposes the tissues to bacterial attack by lowering their tone and resistance.

While the foregoing possible effects of hyperocclusal force upon the mineral renewal of periodontal bone seem logical, they are far from being proved. More clearly established are the indirect effects of perverted and excessive force upon the periodontal bone via the soft periodontal tissues. Constantly repeated intermittent excessive force via the tooth produces a hyperfibrosis of the periodontal membrane that pinches the small vessels, interfering with nutrition of the membrane and its dependent osseous structures and resulting in diminution of their health and antibacterial potency. Possible stimulation of the osteoclasts, and even the cementoclasts, completes the setting of the stage for progressive

destruction of the periodontal bone of those teeth that are in hyperclusion in any passing functional relationship of the dentures.

The diagnosis of any periodontal condition, therefore, calls for expert knowledge of both normal and pathologic occlusion, and a careful evaluation of cuspal contacts during jaw movements. Periodontists must be given credit for being among the pioneers in the study of dynamic occlusion of natural teeth. Yet it is undeniable that many advanced pyorrhea cases, after years of periodic treatment, still present uncorrected occlusal deformities, such as too few teeth occluding in centric jaw closure, or tooth cusps striking upon single inclined planes rather than between two balanced inclined planes which normally cradle an opposing cusp and render the resultant of the forces upon it a vertical force. Other commonly neglected types of malocclusion are those in which the dentures function in an eccentric relationship, with cuspal conflicts in centric closure. We must have ever before us the concept that the dentures are constantly in motion and operate under a force so onerous that it must be equitably distributed to as many teeth as possible.

CENTRIC OCCLUSION

The starting place of all jaw movements is centric relationship, and every diagnosis, in every branch of clinical dentistry, must therefore be based upon true centric closure. It is not sufficient to ask the patient to close the dentures, and to assume that this closure is correct. Many patients do not have intercuspation (interdigitation of cusps) in true centric closure. They may bring into contact only a few teeth, and these upon cusp points or inclined planes that are not counterbalanced by other planes. Such patients unconsciously find an eccentric denture relationship, with function, in which the jaws obtain the best possible support and there are the largest number of and the most effective contacts of opposing cusps and ridges for mastication.

Such a relationship, known as eccentric intercuspation, or a convenience relationship, is far more common than is generally supposed. In non-masticatory closures and in rest position, the dentures must either assume an unnatural position or must close on inclined planes or cusp peaks, and perhaps all too few of those. While there are compensatory deformations of the condyle head and mandibular foramen of the temporomandibular joints in some cases in which convenience relationships have persisted for many years, in the vast majority of cases the periodontium breaks down before such joint changes occur.

Another common condition is centric interference, in which the dentures reach ultimate closure in true centric relationship, but strike first upon inclined planes of ridges or cusps and slide to complete closure. Patients having this condition acquire the habit of avoiding the conflict as much as possible by moving the jaw forward slightly and closing directly upward into the sulci of opposing teeth, rather than on the normal arc of closure having the temporomandibular joint as its center.

For the diagnosis of both eccentric intercuspation and centric interference, the patient must bring the dentures together in true centric closure, and such closure is determined by the position of the condyle heads in the mandibular foramina. True centric position is not a denture relationship: it is a jaw to skull relationship. It is not necessarily the closure in which there is intercuspation; neither is it the most retrusive position into which the condyle heads can be forced. True centric relationship is the most retrusive mandibular position from which functional movements can be made with ease and comfort. True centric position is the jaw position in which the mandibular condyles are cradled in the deepest pos-

terior portion of the mandibular fossae of the temporal bones.

The diagnosis of centric closure depends on the physiologic fact that the first half inch of opening and the last half inch of closure of the jaw takes place upon the imaginary hinge axis cord which runs through some point in the condyle heads. The patient is, therefore, required to repeatedly open and close the jaw a half inch, completely relaxing the musculature while doing so. Meanwhile, the dentist holds his thumb and finger upon the mental process and exerts very slight retrusive pressure. If the pressure is too heavy, the patient will stiffen the muscles and resist it. As the patient relaxes, the operator's hand relaxes its pressure, until finally the patient is champing lightly in space or lightly touching the teeth without really biting, with practically no guidance on the operator's part. When this free, relaxed champing has been accomplished, the patient is instructed to let the teeth occlude very lightly and to stop on the point of initial contact and hold the position without any sliding or motion. Examination may then show the teeth to be in proper intercuspation, and the operator knows that centric closure is correct.

On the other hand, examination of the initial contact between the dentures may show the anterior teeth to be open, and the posterior teeth to be striking upon cusp or ridge planes rather than in cusp-to-sulcus intercuspation. The patient is them instructed to close the jaws the rest of the way, and one of two things will happen: he may slide the jaw upward and forward a slight distance into full centric closure, thus indicating that there is centric interference; or he may deliberately search for and find intercuspation in a definitely eccentric position.

Eccentric intercuspation can be corrected only by orthodontic treatment or by "occlusal reconstruction," the rebuilding of all occlusal surfaces of the teeth with hard cast metal veneers.

Selective spot-grinding of the occlusal surfaces can, however, ameliorate eccentric intercuspation by bringing into contact in centric closure a larger number of cusps or planes, and by flattening the initial occlusal contacts to remove the lateral or mesiodistal thrust of unbalanced single inclined planes. The paths over which the cusps glide during denture movement from centric to convenience relationship can also be smoothed so that there will be no high spots or bumps to ride over between centric and convenience jaw positions. Such bumps suddenly direct the entire occlusal force to one pair of teeth, and are therefore most pernicious.

Centric interference can be entirely overcome by selective grinding. The patient is instructed to champ lightly in space, while a strip of thin oiled carbon paper is held between the dentures. When the operator is sure that the condyle heads are functioning in true centric relationship, the patient is instructed to lightly tap the teeth together, being careful not to bite hard. After several light taps, the patient is stopped, and the operator will find the points of initial denture contact marked by carbon dots upon the teeth. It may be that the initial impact is borne by one or two pairs of teeth, and these will be found to show the greatest periodontal bone resorption. As the mandibular denture glides down these initial cusp planes toward full centric closure, other occlusal contacts may come into effect, and the teeth sustaining these secondary contacts will not have suffered so much periodontal damage as those receiving the initial impact.

The initial contacts having been marked for diagnosis and interpretation of the x-ray pictures, the next step is to mark the entire path of the "slide" to centric closure. The patient again champs lightly in the air and closes the teeth upon the carbon paper. He is now instructed to "close the rest of the way." A mark is thus obtained from the point

of initial impact to full centric closure. These carbon marks will be found on the distal planes of lower cusps and ridges, and upon the mesially sloping planes and ridges of upper teeth. All other carbon marks may be disregarded as having been made in centric position. As would be expected from the position of the carbon marks, the lower teeth are thrust mesially in their sockets, and the resorption will be deepest on the mesial surface of the mesial roots. The converse is true of the upper teeth. Very often, the bone line, in the x-ray picture, will start at a low point on the mesial surface of a lower tooth and slope mesially upward toward the adjoining tooth. Resorption is deepest on the distal root surface of the opposing upper tooth.

Correction of centric interference consists of grinding the cusp-peak portion of each carbon mark, cutting deepest at the peak end and tapering the cut away to nothing just below the center of the mark. Thus, the cut portion of each mark is opposite the uncut end of the opposite mark, and the two cuts flatten the steep angulation of the cusp planes. While the interference could in many cases be removed by grinding entirely upon the upper marks, the cut would be excessive as compared to the slight amount of tooth structure removed when both the upper and lower marks are cut as above described. More important, the balanced support of this pair of cusps, and perhaps of the teeth carrying them, would be lost in complete centric closure.

Before attempting the selective grinding procedure in the patient's mouth, the operator is urged to select a pair of models with long unworn cusps and mount them close to the hinge axis rod of a hinge axis articulator, with the occlusal plane sloping upward toward the incisors. This will produce, artificially, a centric interference between the models. The stone models can then be carbon marked and the marks analyzed and the interference removed by scraping the cusp planes and ridges with a lance or knife blade. Several cases should be corrected on mounted models before correction is attempted in the mouth.

An occlusion showing centric interference is an especially pernicious, pathologic type because it delivers its pathologic force against cancellous bone, which is prone to resorption. Lateral interference (i.e., in lateral jaw movements) thrusts are made against the compact bone of the labial or lingual cortical plate of the jaw. Resorption is slow compared with that following centric interference.

EXCURSIVE INTERFERENCE

The commonest cause of excursive interference during masticatory movements of the jaw is excessive vertical overbite of anterior teeth. This is the commonest malocclusion, resulting from the habit of leaning the chin upon the hand during the years of childhood's rapid growth. Such posture pressure intrudes the posterior teeth, shortening them, and making the anterior teeth long by comparison. When the mandible is moved out of centric relationship, the denture promptly "rides" open, upon the steep inclined planes of cuspid teeth in lateral excursion, and of incisor teeth during protrusion of the jaw. Often, it is impossible to fully correct this condition except by orthodontic treatment. Even occlusal reconstruction of all posterior teeth cannot always accomplish it without opening the bite too far for safety of the periodontium of the posterior teeth.

Periodontists should never lose an opportunity to bring home to the dental profession that the prevention of periodontosis in middle and later life begins with the prevention of malocclusion, or with early orthodontic diagnosis and treatment, in childhood. They should join the orthodontist too in bringing home to physicians, and particularly to pediatricians, the fact that while instruction to mothers to place infants upon their stomachs at bedtime may ease in-

fant colic, it may have lastingly harmful results in deforming the jaws and forcing teeth to erupt in malposition, lessening masticatory ability and inviting premature denture destruction by periodontosis in middle life. It goes without saying that the general practitioner must be brought to realize also that tooth form and dimension must be restored faithfully in the making of even the smallest tooth restoration following caries.

The diagnosis of excursive interference is accomplished by having the patient close the jaws in centric relationship and move them to a lateral or protrusive position. The patient is stopped at various points en route, and instructed to hold the position while the operator evaluates the contacts between upper and lower teeth on both sides of the arch. If the cuspids, for example, are the only teeth to make contact in a lateral position, holding the rest of the dentures 3 or 4 mm. apart, it is a safe assumption that full correction cannot be made without cutting the long cuspids unduly.

Frequently, correction must be made by a compromise between selective grinding and occlusal reconstruction, some teeth being cut down and others built up. Not infrequently, the orthodontic movement of one or two teeth, to be retained by bridges or partial dentures in the plan of reconstruction, is indicated. In the case of some young patients, full orthodontic treatment is possible, to be followed by a reasonable amount of selective grinding to refine the functional occlusal contacts.

It may be apparent upon intra-oral examination, however, that although the cuspids alone make occlusal contact, a half millimeter closure of the bite in that jaw position, by selective grinding, will bring the second bicuspids into contact; a third millimeter more will perhaps bring in the first bicuspids, and a half more may bring in the molars. All of these measurements, here made suppositiously, are gaged by the distances the various pairs of teeth stand open in the lateral position. The balancing contacts of lower buccal with upper lingual cusps should be similarly evaluated on the other side of the arch, in the same jaw position. If the amount of grinding needed is not excessive, it may be assumed that correction can be made.

A strip of carbon paper is placed along one side of the arch and the patient closes the jaws in centric position. The jaw is then moved, under reasonable occlusal pressure, from centric to a lateral position, and the carbon paper is removed. In interpreting the carbon marks, the direction of the mandibular movement must be kept in mind and the marks be searched for on the planes which would be crossed in that movement. Marks in the bottom of sulci are always made in centric position and are never disturbed in grinding to remove excursive interference. The mates to these sulcus marks will be on the peaks of the opposing cusps, and these enter into lateral contact as well as centric. After the marks have been made upon the teeth, the jaw is again placed first in centric and then in lateral position, and the marks are studied in the mirror, and by direct vision when possible, to determine which part of each mark enters into the excursive interference.

Having once been determined, the centric portion of the mark should be studiously preserved intact, since it is most desirable not to interfere with the centric cradling of cusps between two converging planes. It is also highly desirable not to close the bite any more than is unavoidable. All selective grinding closes the bite, and the amount of closure naturally depends on the amount of destruction of centric contacts during the process. The excursive interference portions of the carbon marks will be those approximating the cusp peaks. This, then, is the basis for a general rule of selective grinding: grind in the sulci, the "valleys," to close the bite in centric

position and to lengthen the cusps by deepening the sulci; but grind on the cusp peaks to reduce excursive interference.

The closure of the bite in centric relationship is desirable only in prosthetic procedures, in reducing an incidental prosthesis that is too high, and in nonorthodontic correction of so-called "open bite" cases. In open-bite cases, only one or two pairs of molars on each side of the arch are in occlusion when the jaw is closed. The bicuspids and anterior teeth are open, having been depressed in childhood by tongue pressure between the anterior teeth in swallowing or tongue-sucking habits. Frequently, the bite may be closed in these cases by grinding in the sulci of the molars. With each additional pair of teeth brought into contact, in this condition or any other, the force distribution becomes more equitable and the future prospects of the periodontium and the dentures are brightened.

All carbon marks go in mated pairs, one on an upper cusp and an opposing mark on the lower cusp which cooperates with it. Since the cusp-peak portions of the paired carbon marks are the excursive interference portions, which mark is to be ground, or shall they both be? The marks must again be studied in the centric and excursive positions to note whether the peak portion of either mark enters into contact in centric relationship. If it does, the mark must not be touched; or, if the mark is a long one, its extreme peak portion may be reduced, a sufficient area being left untouched to support that plane of the cusp in centric contact. Broadly interpreted, this rule would mean that the peak portions of maxillary buccal cusp marks on lingual planes of maxillary buccal cusps would be open to grinding, since they do not enter into centric closure contacts. The peak portions of lower buccal cusp marks upon the buccal planes could not be ground because they *do* enter into centric contact. The exception in the latter case would occur when the lower buccal mark is long enough to permit removing its tip without too greatly reducing the area of its centric contact. For the same reasons, the lingual cusps of lower teeth may usually be ground, while those of upper teeth usually should not be.

When only one or two cusps are in contact in an excursive position, the application of these rules is simple enough. When a large number of cusps and ridges have been brought into contact, there is a confusing multiplicity of marks. One should then keep in mind the planes affected. They will naturally be all mandibular planes facing in the direction in which the mandible is moving, and all maxillary planes facing away from, or resisting, the movement. If mandibular movement is toward the right, all buccal planes will be marked on the right side of the mandibular arch and all lingual planes on the left side. Conversely, the lingual planes will be marked on the right side of the maxillary arch and the buccal planes on the left side. No other marks are to be regarded in correcting the right mandibular movement. This method of classifying and evaluating carbon marks applies in similar manner to the other excursive movements. The contacts in each case should be visualized both in the excursive and in the centric positions of the jaw and dentures.

The correction of the so-called "balancing" contacts of lower buccal with upper lingual cusps calls for a rule of its own, since both the upper and the lower cusps enter into centric contact as well as lateral. The principle involved, however, is the one enunciated above for correcting cusps in centric interference and cusps which enter into both excursive and centric contacts. The peak ends of both the upper and the lower mark are reduced, with care to leave undisturbed a sufficient area of each mark to support

the tooth in centric cradling. Frequently, these balancing areas enter into protrusive contacts as well as the balancing lateral contacts, and, in that case, the ones which enter into protrusive contacts should be spared as much as possible without jeopardizing centric contacts.

In other words, no tooth area should be removed to satisfy one jaw position, if, in another position, contacts will be affected. Careful study will show the way to relieve one position without affecting any other. One thing must be kept in mind: If centric support is unbalanced or destroyed, the tooth will tip or extrude until centric support is regained, and this will often renew the original excursive interference. Centric relation should be improved wherever possible, but it should never be crippled or unbalanced. After correction, each cusp should be cradled between two, or by more, converging planes.

At the conclusion of all selective grinding operations, the anterior teeth should be carefully tested for hyperocclusion, by carbon paper markings which can be compared with simultaneously made marks on posterior teeth. The anterior teeth should also be tested by finger palpation (for want of a better term). The finger is laid across two or three anterior teeth at a time, and the posterior teeth are repeatedly and forcefully snapped together; if a jar or movement is transmitted to the finger by any tooth, the contact on that tooth should be relieved, carbon marking it while finger pressure on the tooth is maintained. The lower tooth is slightly reduced by grinding.

The finger palpation test is invaluable in both centric closure and excursive movements. A finger laid across the bicuspids and molars will detect the slightest tooth movement when the mandible goes into lateral position. Laid across the anterior teeth, the finger will detect hyperocclusal force in both centric closure and protrusive excursions. It goes without saying that no surgical measures, curettage or medication can materially help a tooth that is constantly being rocked in its socket during either centric closure or excursive jaw movements. In some cases, there is no occlusal hyperforce in either terminal jaw position, but there may be at some intermediate point. The finger is an invaluable aid in detecting it.

Interference of the incisors in protrusive denture movements should be reduced as much as possible by grinding the incisal edges of upper teeth. Frequently, the lower ones must be ground also. They will then gradually extrude, and while they will extrude more slowly with each subsequent grinding, they will continue to extrude. The one exception to this rule seems to be the case in which the incisors erupted into such positions that they have never had centric contact.

When a case cannot be fully corrected by selective grinding, occlusal reconstruction may be resorted to if the patient has the time, means and mental attitude to render that complex operation possible. For the large majority of patients, the policy must be one of correction so far as it can be accomplished by selective grinding, on the principle that "half a loaf is better than none."

The essential thing before us is to realize that "spot grinding," in the old sense, is obsolete. The hit-or-miss reduction of cusps is not only useless: it is often harmful. On the other hand, with a knowledge of occlusion and careful study of the science of selective grinding, acute occlusal trauma may be overcome, and the life of the periodontium under the dentures can be greatly lengthened.

In closing, may I again stress the importance of centric interference. This condition is far more common than is generally realized, especially in those cases of periodontosis which do not respond readily to ordinary treatment. Recently, I gave a practical course in selective grinding to a group of the California Institute of Periodontology. On the last

afternoon, selective grinding was to be carried out in the mouth, and each man in the group brought in a patient, naturally one who had not responded to ordinary methods of treatment. Of the sixteen patients, fifteen were found to have centric interference.

Above all, I would stress the fact that selective grinding is a complex science. It should not be rashly undertaken in the patient's mouth. Rather, it should first be practiced on models mounted upon an articulator capable of making mandibular movements. It is not necessary to mount these models and adjust the articulator with the meticulous care that would be required if a diagnosis were to be made or some form of prosthetic appliance were to be constructed for later introduction into the mouth. In this case, nothing is to be placed in the mouth. For training only, the models are to be coordinated to the movements of this particular articulator, regardless of what they may be. That is exactly the problem presenting itself in the mouth. Tooth form must be coordinated to the jaw movements, whatever they may be. When, however, a cast is first corrected experimentally upon the articulator, and the correction is then to be reproduced in the mouth, the models should be mounted carefully in orientation to the hinge axis cord, and the articulator should be adjusted to reproduce the jaw movements with the utmost possible fidelity.

SUMMARY

Pathologic occlusion is any form of occlusion in which the normal functions of the dentures as a multibladed shearing mechanism cannot be performed.

In such conditions, a few teeth receive pathologic occlusal force and others receive none, during functional excursive movements of the mandible and mandibular denture; and periodontal pathosis is induced in both cases.

Hyperocclusal force is always harmful, whether in centric closure or in the excursive movement contacts; and it is apt to be more harmful in centric closure. Centric hyperocclusal force is especially in evidence in two conditions not yet sufficiently recognized: centric interference and eccentric intercuspation. Centric interference may be discovered and then eradicated by selective grinding, by the technics given. Pathologic occlusion can be ameliorated in eccentric intercuspation cases.

Excursive interference may be fully or partially corrected by scientific selective grinding.

Hyperocclusal force is only one of the three etiologic factors in periodontal disease, but is an ever-constant one, since the dentures constitute a masticating machine that is seldom at rest. Occlusal contacts must therefore be studied and corrected from the dynamic rather than the static view of occlusion.

Selective grinding for the correction of pathologic occlusion is not a hit-or-miss affair, but one to be studied in advance and scientifically applied, for both the correction and the prevention of periodontoclasia.

Full correction of either excursive interference or convenience relationship often calls for both selective grinding and "occlusal reconstruction." Frequently, its only correction is by orthodontic means in childhood.

From the standpoint of occlusion, the prevention of periodontal disease should commence in childhood, with the prevention, early detection and early treatment of malocclusion by orthodontics. It should continue throughout life by making every tooth restoration and replacement adequate in the reproduction of tooth form and dimension and the establishing of a multiplicity of occlusal contacts for the equitable distribution of occlusal force.

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NITROUS OXIDE-OXYGEN ANALGESIA

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ANALGESIA, a state in which there is a loss of sensation to pain without loss of consciousness, is an ideal state for dental procedures involving cavity preparation, scaling and extraction of loose and deciduous teeth.

The agent of choice for producing such a state is nitrous oxide, which may be used with air or oxygen or both, in any proportions. The depth of analgesia desired will depend on the character of the work to be performed.

The empiric, rather than the rational, use of nitrous oxide and oxygen analgesia has tended to create a situation in which results have been controversial.

Those who have adopted a scientific approach in the use of analgesia have been rewarded by increased confidence in the patient-dentist relationship. Those who have persisted in the use of analgesia without a thorough knowledge of the pharmacodynamics of the agent used, and a knowledge of the signs and symptoms of analgesia, have met with failure.

What constitutes a scientific approach to the use of analgesia with nitrous oxide and oxygen? 1. A knowledge of the physiologic action of nitrous oxide. 2. The ability to classify patients. 3. A knowledge of the apparatus used. 4. The ability of the operator to work successfully during analgesia.

The induction of anesthesia is entirely different from the induction of analgesia. Pure nitrous oxide is primarily a stimulant, secondarily a depressant and thirdly a paralyzant.

To produce anesthesia, which means the production of a state in which there is loss of consciousness with loss of sensation, the deeply depressant, or preparalytic, stage must be reached. To produce analgesia, the depressant stage must never be reached. The depressant stage may be avoided by the addition of sufficient oxygen to the nitrous oxide to make a mixture that will, at all times, keep the patient in the stimulation stage.

Without oxygen, one passes through the planes of analgesia very rapidly and enters the second stage of anesthesia. With the addition of oxygen, this speed of passage is slowed proportionately to the amount of oxygen given until, with a high percentage of oxygen, a delicate balance is obtained. Thus, the first stage of anesthesia, which includes all stages of analgesia, can be maintained. By even finer balancing of the nitrous oxide and oxygen mixture, any desired plane of analgesia can be maintained.

The recognition of the signs and symptoms of analgesia, as well as the signs and symptoms of anesthesia, is essential, if the scientific approach to analgesia is to be attained. Just as nitrous oxide-oxygen anesthesia can be divided into three stages, the analgesic state may be divided into three planes. Nitrous oxide acts first on the sympathetic nervous system. The sympathetic nervous system supplies the dilator pupillae. We get, therefore, a moderately dilated pupil. Pulse and respiration rates are increased. If movement of the muscles occurs, they are somewhat spastic. All reflexes are present and may be slightly exaggerated.

In some persons, sensations become momentarily keener. The prick of a pin may for an instant exaggerate the pain, but this acute sensation quickly becomes dulled. With the addition of a large percentage of oxygen to the nitrous oxide, these reactions are reduced in rate and intensity to a marked degree. There-

Read before the Massachusetts Dental Society, Boston, Mass., February 2, 1942.

fore, in the first plane of analgesia, we may expect to find few changes from the normal other than a slight dulling of sensation.

The second plane is ushered in with a more marked change in sensation. Consciousness is present, but the stimulation effect of the nitrous oxide is slightly diminished. In some patients, there is a feeling of warmth or tingling of the extremities. There may be slight dizziness, depending upon the amount of oxygen introduced. Respiration and pulse rates are increased to slightly above normal. The pupil is moderately dilated, but all reflexes are present. The eyeball moves voluntarily.

The third plane of analgesia is reached when most sensation to pain is lost. However, the tactile sense and consciousness remain present. As long as sufficient oxygen is given, this plane can be maintained. When the oxygen is insufficient to maintain consciousness, the patient enters the second stage of anesthesia.

Between the third plane of analgesia and the second stage of anesthesia is a period in which so-called "day dreaming" and the reactions to such dreaming take place. Consciousness is present, but the mind begins to wander. At times, the mind is focused on the actions of the operator, but soon returns to "day dreaming."

In this plane, respiration and pulse rates remain increased. The pupil becomes contracted, but all reflexes are present. Questions are answered in a more or less guttural voice. There is a feeling of lightness, such as follows the drinking of one or two cocktails.

A knowledge of the physiologic action of nitrous oxide necessitates knowing its action from the planes of analgesia through the stages of anesthesia.

The susceptibility of patients to nitrous oxide varies. Hypersusceptible patients may quickly pass from the stage of analgesia to the surgical stage of anesthesia. Without a recognition of the signs and symptoms of anesthesia, jactitation, denoting air hunger, may occur. If this is not recognized, the movements of the patient may be interpreted as lightness, and straight nitrous oxide may be pushed until the patient is in the danger stage.

If success with the use of analgesia is to be attained, classification of patients is advisable. Just as there are some persons who cannot be surgically anesthetized under ordinary conditions with nitrous oxide, so are there some who find analgesia is not the pain-reliever that it is said to be.

Fortunately, the patients who do not react favorably to nitrous oxide-oxygen analgesia are very few. They fall into four classes: the hypersusceptible, those with an extremely high threshold for pain, those with an extremely low threshold for pain and those with nasal obstruction.

The hypersusceptible patient is one who cannot tolerate nitrous oxide. Its odor may be nauseating. Its effect may be irritating. During analgesia, the patient may be so restless that careful operating becomes impossible. Then there is the patient who has a natural intolerance to nitrous oxide.

Those patients with an extremely high threshold for pain may need little nitrous oxide for the elimination of painful stimuli.

The patient with an extremely low threshold for pain must be placed in the third plane of analgesia for the less painful operation, and practically in the second stage of anesthesia for the more painful operation. In this stage, excitement may occur and the operation may have to be discontinued. Patients with any nasal obstruction cannot be given analgesia.

The patient who has had no experience with analgesia must be educated to the use of nitrous oxide analgesia. He must be made to understand that if pain is to be controlled, he must breathe through the nose, and not at any time through the mouth. He must be told that there will be a temporary change in his sensa-

tions. He may feel a little lightheaded. Not all patients have tingling sensations in the extremities. He must be informed that these sensations may occur, and are only temporary. The patient must be educated to inform the operator if any pain is present in order that the analgesia may be deepened. He must know that he will be conscious at all times and should direct the operator in pain control.

Fortunately, the modern apparatus is so constructed that 100 per cent nitrous oxide cannot readily be administered. For that matter, neither can 100 per cent oxygen be given with some of the apparatus.

The modern apparatus is patient controlled. This means that should the patient desire to increase the depth of analgesia, he does so by squeezing a bulb, which opens a valve, allowing 100 per cent, or almost 100 per cent, nitrous oxide to be inhaled.

Many times, a patient may begin to feel an operative procedure and manifest signs of pain. After being told to squeeze the bulb, he does so, but breathes through the mouth instead of the nose. The operator is at a loss to understand why pain should be manifested when the bulb is being squeezed vigorously.

On the other hand, there are some patients who soon find a great deal of pleasure in "day dreaming" under analgesia, permitting themselves to enter the stage somewhat beyond analgesia, and thus the bulb drops from the hand. They soon feel very light and reach for the bulb to again saturate themselves with the analgesic. This process of "seesawing" from low to high and back a number of times may result in such peculiar reactions as nausea, dizziness, tinnitus and irrationality. In my opinion, analgesia should be operator controlled to avoid its administration for anything other than pain control.

There is some controversy as to what constitutes a proper starting mixture. One reads that 80 per cent nitrous oxide and 20 per cent oxygen at 1 gallon per minute, or at 1 mm. of pressure, is the logical starting mixture. Again, one reads that 50 per cent nitrous oxide and 50 per cent oxygen at 2 gallons per minute, or at 2 mm. of pressure, is the logical starting mixture.

There are two factors which control the commencement of analgesia: the amount of pressure necessary for respiration to continue without embarrassment or a feeling of suffocation, and a gas mixture consistent with the patient's toleration from the standpoint of odor and sensation.

One patient may be able to breathe easily with 1 mm. of pressure or 1 gallon per minute, whereas another may require 3-5 mm. of pressure or at least 3 gallons per minute to avoid respiratory embarrassment.

The pressure or volume necessary to preserve normal respiration varies with the individual and can easily be adjusted. After all, it is the mixture of nitrous oxide and oxygen which produces the analgesia and not the pressure.

Sensibility to pain is lost first in the terminal branches of the nerves, next in the trunk and lastly in the centers. The teeth are supplied by terminal branches and are, therefore, easily acted upon by anesthetics.

We know that nitrous oxide forms no chemical compound with the blood, but does form a physical mixture with the plasma. We also know that, under normal pressure (152 mm.), oxygen unites with the hemoglobin of the red corpuscles to form oxyhemoglobin. Very little oxygen goes into solution with the plasma. Therefore, in any nitrous oxide and oxygen mixture, 100 per cent of the nitrous oxide enters into solution with the plasma. Almost 100 per cent of the oxygen unites with the hemoglobin to maintain internal respiration under normal pressure.

When sufficient nitrous oxide has entered the plasma to attain at least partial saturation, there is an effect on the

terminal nerves. The depth of analgesia will depend on the amount of plasma saturation with nitrous oxide.

To secure terminal nerve analgesia, a large percentage of nitrous oxide is not required. If sufficient time is permitted to allow plasma saturation, 10-15 per cent of nitrous oxide in a 100 per cent mixture should be all that is necessary to produce this effect. This cannot hold true for tissues supplied by nerve trunks. Under such a condition, a far greater percentage of nitrous oxide by volume will be necessary before complete sensation is lost.

When 60, 70 or 80 per cent nitrous oxide is given, as advocated by the textbooks and in the literature, anesthesia is induced and not analgesia. If sensation is to be lost and consciousness retained, at no time, except for definite moments, should even "wandering of the mind" be permitted to occur.

Forty per cent nitrous oxide is sufficient to induce anesthesia in many people. I have concluded surgical procedures with a mixture of 30 per cent nitrous oxide and 70 per cent oxygen during the last few minutes of operating and have had satisfactory anesthesia. It is evident, therefore, that if true analgesia is to be attained, the smallest amount of nitrous oxide with the greatest amount of oxygen consistent with pain control is the mixture to be used.

We have produced successful dental analgesia in a series of cases by using an average of 10 per cent nitrous oxide with 90 per cent oxygen.

The question is asked, "If 90 per cent oxygen is breathed for a long time, may not apnea or acapnia occur with a cessation of respiration?" We have not seen this in our series. Theoretically, it could occur. This condition may easily be corrected by closing the exhaling valve and permitting the patient to rebreathe for a moment, allowing the carbon dioxide in the exhalations to stimulate the respiratory centers.

The modus operandi that we use to obtain successful dental analgesia is as follows:

The nasal inhaler is adjusted to the nose with the exhaling valve open. The patient is warned not to breathe through the mouth at any time. He is informed that one breath of air is sufficient to disrupt the analgesia. From 10 to 15 per cent nitrous oxide and from 85 to 90 per cent oxygen is given for at least two to three minutes to permit plasma saturation by the nitrous oxide, which is given in that volume or at that pressure best suited to the patient. Rarely should the volume be more than 3 gallons per minute, nor should the pressure be more than 3 mm.

Saturation takes from two to three minutes and operating should not commence until saturation has taken place.

If a mesioclusal cavity in a molar is to be prepared, a mixture of 15 per cent nitrous oxide and 85 per cent oxygen is recommended until completion of the excavation through the dentino-enamel junction, which, as a rule, is a very sensitive area. The amount of nitrous oxide in the mixture should be decreased to 10 per cent until the area above the horn of the pulp is reached. Here, the nitrous oxide percentage should again be increased to 15, to avoid pulp sensation, with care not to cause an exposure and not to overheat. At frequent intervals, the bur must be removed from the cavity which is being excavated. The effect of overheating may necessitate anesthesia instead of analgesia for control of pain, and this procedure is not desired. In other words, the percentage of nitrous oxide is increased as sensation increases and the percentage decreased in operating in those areas where sensation is diminished. At no time should more than 20 per cent nitrous oxide be used for analgesia.

A saliva ejector should be in the patient's mouth at all times, to prevent disruption of analgesia by bending over to

empty the mouth. No mouth props or throat packs are necessary.

The odor of rubber is nauseating to many persons. A little dab of toilet water or oil of orange on the nasal inhaler tends to reduce this disagreeable sensation.

CONCLUSION

It seems quite a radical change to suggest the use of 10-15 per cent nitrous oxide with 85-90 per cent oxygen to induce analgesia, as this is directly opposite to the technic advocated by textbooks and the literature.

With this technic, there is no nausea, dizziness or other unfavorable sequela.

Patients who have been under analgesia for long periods of time are able to leave the dental chair as soon as the nasal inhaler has been removed.

311 Commonwealth Avenue.

ACTION OF AMMONIA ON LACTOBACILLUS AND SALIVARY MUCIN

By CARL J. GROVE, Ph.G., D.D.S., and CARL T. GROVE, D.D.S., St. Paul, Minn.

IN recent years, considerable interest has been manifested in the etiology of dental caries and possible measures for its control. An excellent reference source for observers and investigators in this field is "Dental Caries," published by the Research Commission of the American Dental Association.

In 1934 and 1935, we[1, 2] published our findings in a study of the ammonia content of saliva in relation to the incidence of dental caries. In this report, we stated that the ammonia content of saliva is proportionate to the susceptibility to caries. In a study of several hundred cases, we found that when the salivary ammonia was high, the susceptibility to dental caries was diminished or absent, and, conversely, when the ammonia content of the saliva was low, the tendency to dental caries was present in varying degrees.

White and Bunting,[3] and Youngburg,[4] disagreed with the method that we employed for the ammonia determinations, stating that an aeration method was more suitable. The method employed by us was the Folin-Bell permutite procedure which makes possible the estimation of the nonprotein nitrogen (ammonia) present. The aeration method employed by them indicates both the protein and the nonprotein nitrogen compounds present, these findings showing no relationship to the incidence of dental caries. There is no reason to believe that the amount of total nitrogen in the saliva has any influence on the susceptibility to dental caries. However, as we have shown, the amount of inorganic or nonprotein nitrogen in the saliva is in proportion to the degree of susceptibility to dental caries.

Our further studies to determine the action of large amounts of ammonia in the saliva in inhibiting caries have indicated that ammonia exerts an influence in at least two important ways. First, ammonia is a most effective mucin solvent, and our conclusions are that this action tends to loosen mucin plaques and to inhibit their formation. Secondly, ammonia inhibits the growth of the lactobacillus. If we accept the theory that the cause of dental caries is the production of acids by lactobacilli held in close contact with the tooth surfaces by mucin deposits, it is obvious that a normal constituent of human saliva, present in suf-

ficient quantities to keep the salivary mucin in solution and to inhibit the growth of lactobacilli, would be of great importance in reducing the incidence of dental caries.

To demonstrate the solvency of salivary mucin in an ammoniacal solution comparable in strength to that found in the mouth, we prepared 300 mg. of dried salivary mucin according to a standard method. The dried mucin was mixed thoroughly with 10 cc. of a 0.006 per cent solution of ammonia until in solution. After the solution had been allowed to stand for twenty-four hours, only a slight trace of the mucin had precipitated, an indication that the solution was approximately 98 per cent efficient as a solvent of salivary mucin.

It is, of course, to be expected that any alkaline medium would suppress the growth and activity of the lactobacilli and neutralize the acids formed by them. However, to have demonstrable evidence, we employed a simple colorimetric method developed by Marshall L. Snyder, of the University of Michigan.[5] Shake tubes containing glucose-agar and a bromcresol green indicator with a pH of 5.4 were prepared for us through the courtesy of the bacteriologic department of the University of Minnesota Medical College. To fifty of these tubes, 0.2 cc. of saliva was added, and to twenty-five of these, 0.2 cc. of a 0.006 per cent ammonia solution was added, the tubes being preheated to 45° C. All the tubes were then shaken thoroughly and immediately cooled and placed in an incubator at 37° C. The bromcresol green indicator at pH 5.4 is green. If there is no activity of the lactobacilli, the color remains green. If there is activity of the organisms resulting in acid formation, the green turns to yellow.

Of those tubes in which no ammonia was introduced, 80 per cent turned yellow within from twenty-four to forty-eight hours, an indication of continued activity of the lactobacilli, while all those tubes containing ammonia remained green up to seventy-two hours, this demonstrating the inhibitory effect of the ammonia on the lactobacilli.

In 1940, Stephan[6] suggested the use of urea in a mouth rinse to control caries, explaining that urea, on breaking down, would form beneficial ammoniacal compounds.

Recently, Wach, O'Donnell and Hine[7] presented work showing the inhibitory effect on lactobacilli of urea in combination with quinine. They state that the urea is broken down into ammonium carbonate to form an alkaline medium and that quinine is used in conjunction because of its germicidal action. They have shown that the effect is not only inhibition of the lactobacillus activity up to forty-eight hours, but also elevation of the pH to the alkaline side for twenty-four hours. The clinical use of this solution as a mouth rinse has similar results.

Therefore, from our own investigations and those of Stephan and Wach, O'Donnell and Hine, it would appear that ammonia is a significant factor of the saliva in relation to susceptibility to dental caries and that its clinical use in the mouth deserves further consideration and development.

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HORIZONTAL DIMENSIONAL CHANGES IN COMPOUND IMPRESSIONS

By CARL AUGUST SCHLACK,* D.D.S.; DONALD WILLIAM THOMPSON,† D.M.D., and GEORGE D. VINEYARD, D.D.S., Washington, D. C.

MOST of the work on compound impression materials relative to dimensional changes has been done by the Dental Section of the Bureau of Standards, supported by the American Dental Association. In those investigations on compound changes in full impressions,[1] the method of procedure was not described, since the thesis was concerned more with making a departmental activity report, which included results obtained, than with detailed procedure. A year later, more studies were made.[2] These stressed compound changes in relation to inlay impressions. Dimensional changes were evaluated by using balls, cubes, squares and cylinders of compound subject to various controlled treatments and the use of different types of apparatus.

Throughout the dental literature here available, no experimental data could be found on dimensional changes in full compound impressions over a set time interval when subject to those environmental phenomena ordinarily found in any dental office. Experimental data are particularly lacking on dimensional changes in full compound impressions after the initial change brought about by chilling and after solidification of the compound is completed.

PURPOSE

The purpose of this work is to determine what horizontal dimensional change takes place in compound impressions when subject to ordinary room temperature over a period of two days.

PROCEDURE

Metal models were made of a maxillary and mandibular edentulous arch. Two vulcanite trays were constructed, one for each metal cast. Small metal stops were attached permanently to the inside of the trays at the median line and posteriorly near the terminations of the trays. The stops were placed in a position corresponding to the ridge of the cast. Thus, each tray contained three stops arranged triangularly. The compound was warmed until it could be easily manipulated, placed in the trays and pressed down over the metal casts until all three metal stops on the inside of the trays came in contact with the metal ridge. In this way, a uniform thickness of compound could be obtained for each impression made from the same metal casts. After chilling, the compound impression was removed from the metal cast and then removed from the vulcanite tray. A carpet tack was heated and the head embedded externally near the buccal periphery at its extreme posterior aspect. This was done on both sides of each maxillary and mandibular impression. The shanks of these tacks were in a horizontal position at right angles to the impression so that the distance between the points of the tacks could be measured and thus any variation in a horizontal direction could be recorded.

Three measurements were made with a micrometer; the first immediately after the impression had been prepared for this procedure. Twenty-four and forty-

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eight hours later, the second and third measurements, respectively, were made. Changes in dimension were carried to one-thousandth inch.

In all, 100 impressions were made as described, fifty of the maxillary and fifty of the mandibular casts. All compound used was fresh, procured from the same manufacturer and not reused. Impressions were permitted to remain on laboratory benches at room temperature without further treatment.

RESULTS

As may be seen from Table 1, maxillary compound impressions with an expansion in horizontal dimensions showed a tendency to return to the initial measurement within forty-eight hours. Mandibular compound impressions (Table 2), expanding, showed a tendency toward further expansion within forty-eight hours. Both maxillary and mandibular impressions that contracted exhibited a tendency to continue contraction within forty-eight hours, but at a reduced rate. The majority of maxillary and mandibular impressions showed contraction in horizontal measurements within forty-eight hours. One maxillary impression and three mandibular impressions showed the greatest change.

TABLE 1.—MAXILLARY COMPOUND IMPRESSIONS, HORIZONTAL DIMENSION CHANGES

	No. of Impressions	After 24 Hours (Average Change)	No. of Impressions	After 48 Hours (Average Change from Initial Measurement)
Contraction	39	0.003 inch	38	0.004 inch
Expansion	7	0.008 inch	8	0.002 inch
No change	4	—	4	—

TABLE 2.—MANDIBULAR COMPOUND IMPRESSIONS, HORIZONTAL DIMENSION CHANGES

	No. of Impressions	After 24 Hours (Average Change)	No. of Impressions	After 48 Hours (Average Change from Initial Measurement)
Contraction	41	0.0032 inch	44	0.0038 inch
Expansion	7	0.002 inch	6	0.0056 inch
No change	2	—	—	—

CONCLUSION

Results obtained in this work lead to the conclusion that changes occurring within forty-eight hours in horizontal dimensions of full compound impressions subject to room temperature and devoid of all rigid support are almost negligible in the majority of cases with the brand of compound used and after initial chilling changes.

(The opinions or assertions contained in this article are the private opinions or assertions of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large.—Article 113, U. S. Navy Regulations.)

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SIGNIFICANCE OF RADIOACTIVE ISOTOPES IN DENTAL RESEARCH

By H. Berton McCauley, D.D.S., Rochester, Minn.

THE significance of recent investigations in which radioactive tracer elements were employed as research tools calls for a review of the phenomenon of radioactivity, its application to dental research and the information obtained thereby.

RADIOACTIVITY

The fundamental unit of all material is the atom. Atoms are classified according to their persistence as stable and unstable, and, according to their chemical behavior, into the various elements. Atoms of all the familiar elements are stable in the sense that, under ordinary conditions, they maintain their identities indefinitely. However, a number of elements the atoms of which are unstable occur in nature. Radium, thorium and uranium are examples of unstable elements. Being unstable, such elements decay spontaneously by a process of atomic disintegration. The disintegration of an atom is accompanied by the emission of radiant energy by its nucleus and the conversion of the unstable atom into that of a different element, which may or may not be stable. Ultimately, all unstable atoms attain stability, through one or a series of transmutations. For instance, atoms of radium disintegrate and are converted into radon atoms, which in turn undergo a series of transmutations involving several other unstable elements before they reach stability as atoms of lead. Since each conversion is accompanied by the emission of radiant energy, unstable elements are said to be radioactive.

Radioactivity, then, is the property of unstable atoms, whereby, either free or combined, they emit radiant energy as a result of the spontaneous disintegration of their nuclei. The discovery of the phenomenon by Becquerel[1] in 1896 heralded the modern approach to the study of the atom, which eventually led to the production of artificial radioactive elements. Alpha, beta and gamma radiations are emitted by disintegrating atomic nuclei. Alpha and beta rays are composed of nuclear particles having definite electrical charge and mass. Gamma rays are true vibrations in the ether, comparable to x-rays, but more penetrating. (Nuclear particles are subatomic identities. Being essentially forms of energy, they are not governed by the classical laws of mechanics for ordinary particles of matter, with which they should not be confused. "Particles," in this sense, is a descriptive convenience.)

Nuclear disintegration does not occur in all the atoms of a radioactive substance at one time. Each such element decays at a characteristic rate without regard for its thermal or chemical environment. A plot of the number of atoms against time yields a characteristic exponential curve. (Fig. 1.) The time necessary for one-half of a given quantity of a radioactive element to decay is

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Read before the Section on Histology, Physiology, Pathology, Bacteriology and Chemistry (Research) at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 28, 1941.

called its half-life. This decay factor, which is constant for each radioactive element, is generally employed to indicate its rate of disintegration.

ARTIFICIAL RADIOACTIVE ELEMENTS

Nearly all of the important biologic research involving radioactivity has been accomplished with artificially produced radioactive isotopes. (Isotopes are atomic variations in the same element differing in weight, but not in chemical behavior. Example: Deuterium or heavy hydrogen [H^2] [atomic weight 2] and ordinary hydrogen [H^1] [atomic weight 1] are isotopes.) At first, artificial isotopes were produced as a direct result of atomic bombardment with alpha particles from natural radioactive substances. Thus, Rutherford[2] created the first artificial element (O^{17}) from the bombardment of nitrogen. Unstable isotopes of most of the lighter elements had been produced before the radioactivity now associated with them was discovered, in 1934, by Curie and Joliot.[3]

In the meantime, the development of high voltage ion accelerators, especially the cyclotron,[4] permitted the use of ions other than alpha particles as projectiles for nuclear bombardments. Conceived by Lawrence[5] in 1929, this instrument imparts energies of the order of several million (electron) volts to ions of gaseous elements, hydrogen, deuterium and helium. Isotopes of all the stable elements have been produced by 8,000,000 volt deuterons (ions of deuterium) from the cyclotron. Those which have been utilized in dental research are listed in the accompanying table.

DETECTION

The properties of alpha, beta and gamma radiations commonly employed to detect the presence of radioactive substances are: (1) ionization of gases and (2) reduction of a photographic emulsion. The first is used in detection by means of a sensitive electrometer or counter[6]; the second, when a photographic film is employed.[9] Photographs produced by radiations from radioactive material contained in the object are called radioautographs. (Fig. 2.) They are useful for indicating the relative distribution of radioactive elements in intact tissues.

The Geiger-Müller counter[8] is commonly employed in biologic investigation involving radioactivity. This instrument, as designated at the University of Rochester, collects beta particles emitted by radioactive atoms through the three-thousandths inch walls of a glass tube (Fig. 3) containing hydrogen, 8 cm. of mercury, and alcohol, 1 cm. of mercury.

ARTIFICIAL RADIOACTIVE ELEMENTS USEFUL IN DENTAL RESEARCH

Isotope	Radiations	Half-Life	Energy Radiations* (Million Electron Volts) β-rays	γ-rays
F^{18}	$\beta+$	112.0 minutes	0.7	—
Na^{24}	$\beta-,\gamma$	14.8 hours	1.4	1.5, 2.0, 3.0
P^{32}	$\beta-$	14.3 days	1.7	None
Cl^{38}	$\beta-,\gamma$	37.0 minutes	1.1, 5.0	1.6, 2.1
Ca^{45}	$\beta-,\gamma$	180.0 days	0.2, 0.9	0.7
Sr^{89}	$\beta-$	55.0 days	1.5	None

*β-rays with energies less than 1 mev. are difficult of detection with the usual apparatus.

Penetrating beta particles ionize the gas in the tube. The ions migrate to an electrode charged at several thousand volts. Electric pulses thereby produced are amplified and may be heard over a speaker or registered on a counting meter. The magnitude of "counts" registered by this instrument is proportional to the intensity of radioactivity in the counted sample, other factors being equal. Since the intensity of radiation is a direct function of the number of radioactive atoms disintegrating, the counter is a quantitative device for measuring the relative number of radioactive atoms present in any given sample. This is the basic principle underlying

the use of the counter in biologic experiments. For example, if a certain number of counts per minute of a radioisotope are administered to an experimental animal, and the animal is killed and a tissue sample prepared and counted, the number of counts per minute in the sample, expressed as a percentage of the original dose, represents the actual portion of the dose in the sample. As would be expected, correction for the decay of the isotope must be made in calculating the percentage in the sample.

APPLICATION

The use of artificial radioactive elements in metabolic studies is founded on the postulate that stable and radioactive isotopes are chemically alike and behave identically in the animal organism except when the radiations are so intense as to produce chemical or physiologic tissue changes.

There are certain advantages in the employment of radioactive elements in biologic work: 1. The property of radioactivity makes it possible to trace the element. 2. The minute amount of radioactive material necessary does not interfere with normal metabolism. 3. Tedious purification processes associated with the direct chemical approach are obviated. 4. The element administered may be distinguished from that already present.

Limitations on the use of radioactive isotopes are chiefly (1) the half-life of the isotope and (2) the energy of radiation. Of the artificial elements, none are freer from these limitations than the phosphorus isotope P^{32}. A product of the bombardment of red phosphorus with deuterons from the cyclotron,

$$P^{31} + H^2 \rightarrow P^{32} + H^1$$

it decays with a half-life of 14.3 days, emitting negatively charged beta particles

$$P^{32} \rightarrow S^{32} + \beta^-$$

Advantageous half-life, strong radiations and relative ease of production, plus the vital importance of phosphorus in the nutrition of living tissues, account for its preponderant use in all types of biologic work. Phosphorus is particularly adapted to the study of dental tissues, since it comprises about 17 and 12.5 per cent of the dry weights of enamel and dentin, respectively.

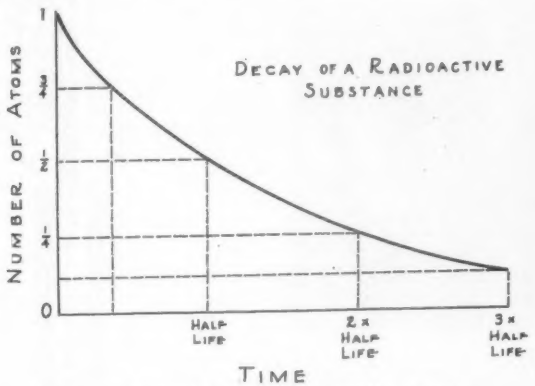

Fig. 1.—Exponential decay of radioactive substance.

METABOLISM OF THE TEETH REVEALED BY RADIOACTIVE ISOTOPES

One of the earliest investigations into the metabolism of the teeth, in which radioactivity was employed as a tracer, was accomplished by Aub.[10] Using a naturally occurring isotope, he demon-

strated that lead could be deposited in living dental tissues, and that, with the passage of time, such deposits apparently disappeared.

PHOSPHORUS

In 1935, Chievitz and Hevesy[11] employed P^{32} in the first metabolism study utilizing an artificial radioactive isotope. Two years later, the same investigators[12] added sodium radiophosphate to the diets of rats and discovered that an appreciable portion of the radioelement quickly found its way into the bones, teeth, muscle and other tissues of growing and adult animals. An exchange phenomenon in which individual phosphorus atoms in the teeth and bones were displaced by phosphorus atoms in the blood, and then were either eliminated or carried to other organs, was demonstrated. When a rat that had been given P^{32} a week previously was killed, it was noted that 29 per cent of the dose was in the skeleton, 3.3 per cent in the continuously erupting incisors, 0.2 per cent in the molars and 3.2 per cent in the liver.[13] The specific activity (ratio of P^{32}:total phosphorus) per milligram of ash of the incisors was two and one-half times, and that of the tibia four times the specific activity of the molars.[14] When the animal was allowed to live longer, the P^{32} depositions in the various tissues decreased as a result of the displacement of the isotope by phosphorus from the diet, except in the incisors where active calcification was taking place.

a b

Fig. 2.—Radioautograph (a) and tooth section (b) which produced it. Radioactive phosphorus was introduced into the whole tooth by submersion in an aqueous solution of sodium radiophosphate for seventy-two hours. The enamel has apparently protected the crown from infiltration by the radioelement. The walls of the cavity were partially covered by the remnants of a gold foil filling.

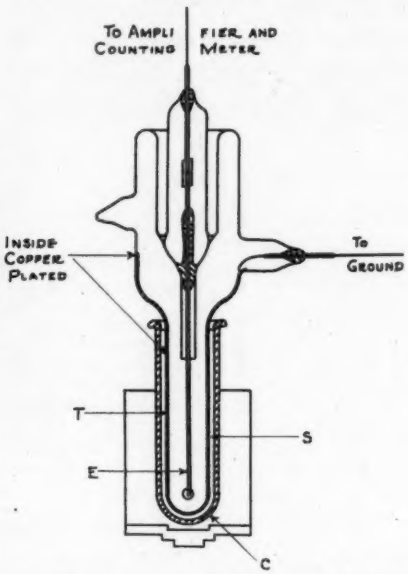

Fig. 3.—Geiger-Müller counting tube. Beta rays from the dissolved sample S contained in the cup C ionize the gas in the tube T. The ions are collected on the tungsten electrode E, and the resulting electrical pulses are amplified and counted by a meter.

To a great extent, atoms newly deposited in the growing incisors of rats were found in the vicinity of the pulp, although some could be detected in the remote parts of the incisor,[14, 15] (Fig. 4). Eight days after administration of a dose of radiophosphate, as much as 8 per cent of the dose could be found in the developing incisors. This seemed to be

an effect of active calcification, since only an extremely small percentage of the dose was present in the molars at that time. The phosphorus metabolism of the dentition of young cats appeared to parallel that of the teeth of rats.

Radiophosphate administered to a 16-year-old human subject[14] showed that each tooth took up about one three-hundred-thousandth of the P^{32} in the dose. It was estimated that 250 days was necessary to replace 1 per cent of the phosphorus in a tooth by metabolic exchange. In four days, approximately one-third of the dose, whether injected or ingested, was eliminated.[13] It was calculated that a phosphorus atom spends about thirty days in the body.[16]

Lawrence and his associates[17] studied the P^{32} exchange in the tissues of several leukemic patients. Administered as a therapeutic agent, the dose took about three days to be absorbed, and thereafter was excreted slowly. At necropsy, the P^{32}:total phosphorus ratios for bone, teeth and liver of two women aged 24 were as shown:

Teeth	0.0004	0.0003
Rib (extracted) (organic material removed)	0.0016	0.0036
Rib (unextracted)	0.0033	0.0027
Liver	0.1760	0.0636

The ratios for bones and teeth were lower, and those for liver higher than the ratios found for other tissues. No consistent relationships existed between the phosphorus content and the phosphorus metabolic activity (exchange) of the tissues. Though it is problematical whether these figures are representative of phosphorus metabolism in normal individuals, investigations into the phosphorus metabolism of normal and of leukemic mice indicated a close parallel, at least in their skeletal exchanges.[18, 19]

Radiophosphorus in the blood of rats is removed rapidly.[20] Only 2 per cent of a dose remained in the plasma two hours after injection of the isotope. At that time, 92 per cent of the P^{32} in the organism was found in the calcified tissues. The greater part of the activity in the bones and teeth was ascribed to a natural affinity of the apatite structure for phosphates.[21, 22] In equilibrium, the phosphate content of bone is 1,000 times that of the plasma.[23]

Manly and Bale[15] determined the retention of labeled phosphorus in the blood and glycol-extracted calcified tissues of twenty-eight rats. Results agreed well with earlier studies involving unextracted calcified tissues,[12, 14, 24] this indicating that the exchange phenomenon took place in the inorganic phase of bones and teeth. If skeletal tissues were considered as containing stable and labile portions, an equilibrium could be

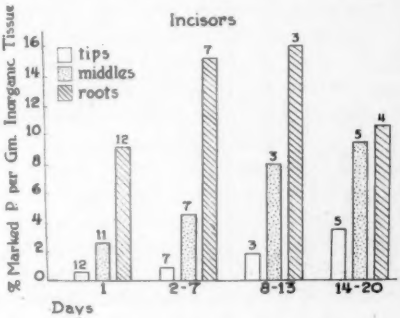

Fig. 4.—Retention of marked phosphorus per gram of inorganic tissue by tip, middle and root portions of incisors of rats fed sodium radiophosphate. The figure above each column is the number of animals represented by the average. (Manly and Bale, in J. Biol. Chem.)

said to have existed between the phosphates in labile bone (and probably dental tissues) and those in the blood plasma. The increased retention of P^{32} encountered in growing tissues indicated that the incorporated isotope was protected from surface interchange by further calcification. The activity in any skeletal tissue was apparently a direct function of its proximity to circulatory elements.

A dog fed radiophosphate revealed a greater uptake of P^{32} in spongy bone

than in dense bone.[25] The amounts of tagged phosphorus in dentin were constant for the various teeth, and of the same order as in dense bone. Enamel contained only traces of the isotope.

In vitro experiments by Manly and Levy[26] indicated that powdered enamel, dentin and bone adsorbed disodium radiophosphate from ethylene-glycol solutions according to Freundlich's adsorption equation. Armstrong[27] observed that powdered enamel picked up inorganic phosphate from solutions; and he believed that the small exchange in enamel as compared with that in dentin (one-tenth) was the result of the smaller size of crystallites in the mineral phase of dentin, the presence of tubulae allowing greater surface contact with fluids containing P^{32}, or a possible circulation of some solution trapped in the dentinal tubulae. Hodge, Van Husen *et al.*[21] repeated the adsorption experiment of Manly and Levy at body temperature, adding hydroxyapatite, and using aqueous instead of ethylene-glycol solutions. Radiophosphate was adsorbed in every case according to the same equation.

Evidence of inorganic phosphate adsorption to the surface of hard tissue crystallites is important for several reasons: 1. It indicates that dental hard tissues adsorb inorganic phosphorus in much the same manner as does hydroxyapatite, which has been suggested to be the principal inorganic molecular component of skeletal tissues.[22] 2. It partly explains the phenomenon of calcification. 3. It provides an explanation for the exchange of inorganic phosphate which takes place between the plasma and the mineral phase of calcified tissues. 4. It accounts for the relatively high concentrations of P^{32} in the surface layer of the enamel of experimental animals to which the isotope has been administered.[28, 32]

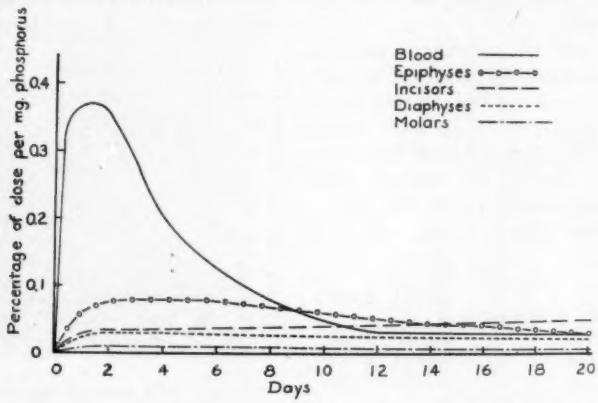

Fig. 5.—Concentration of marked phosphorus per milligram of total phosphorus in tissues of rats. The concentration in none of the calcified tissues reaches that in the blood before eight days. (Manly, Hodge and Manly, in J. Biol. Chem.)

Phosphate adsorption by skeletal tissue crystallites would increase the P^{32} level in a calcified tissue by an exchange of ordinary phosphorus atoms on the surfaces of the minute crystallites of apatite for P^{32} atoms in the blood. The new crystals would have the same P^{32}:total phosphorus ratio current in the circulation. Since large fractions of skeletal tissues have been shown to be labile,[29] the possible significance of adsorption in the

calcification process is considerable. By this reasoning, the enamel, because of the slow diffusion of fluids, would permit meager crystallite surface contact with radiophosphate solution in a given time. Thus, the isotope could be adsorbed only in negligible amounts. This adsorption has been observed.[25, 30]

ENAMEL METABOLISM

The lack of physiologic response in the enamel has caused that tissue to be referred to as "a lifeless, inert, mostly inorganic substance."[31] Attempts to study

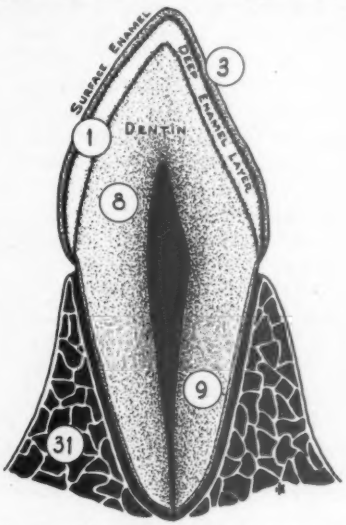

Fig. 6.—Distribution of labeled phosphorus in tooth as indicated by in vivo studies on cats. The encircled numbers are representative of the relative depositions of the radioelement one to nine days after its administration through a stomach tube.

the radiophosphorus metabolism of the enamel of experimental animals by Hevesy, Holst and Krogh[14] and by Manly and Bale[15] proved inconclusive. Later, Hevesy and Armstrong[30] observed that, *in vitro,* the exchange of P^{32} in the enamel was less than 10 per cent that in dentin. They did not concur in the opinion of Volker and Sognnaes[28] that some of the inorganic phosphorus in the enamel could be derived from the saliva. The latter workers[32] demonstrated that the surface enamel of cats retained, on the average, three times as much P^{32} as the remaining enamel when the radioelement was administered through a stomach tube. (Fig. 6.) The distribution of the isotope in the various density fractions of the whole crowns of the teeth of a dog showed an inverse relationship between the density and the concentration of P^{32} in the dentin, but a direct relationship in the enamel. The surface enamel of the tooth of a dog also contained the greatest deposit of the radio element. When the enamel was protected from the saliva by plaster and impression compound, the density-phosphorus relationship in that tissue was reversed. It appeared that the surface layer of the enamel of erupted teeth obtained substantial amounts of inorganic phosphorus by adsorption from the saliva.

More recent experiments by Barnum and Armstrong,[33] who separated enamel into density fractions quite different from those of Sognnaes and Volker,[32] indicated that the most dense fraction of the pooled enamel of four cats injected with sodium radiophosphate did not contain the highest concentration of P^{32}. These workers demonstrated that radiophosphate in saliva could reach the dentin through the enamel, but postulated that, *in vivo,* more phosphate reached the enamel through the circulation and the pulp than was adsorbed from the saliva. The ratio of the activity of 1 gm. of enamel to that of 1 gm. of dentin was 0.07. On the basis of the specific activities of the dental tissues, the rate of phosphorus exchange in the enamel was approximately 5 per cent of that in the dentin.

Pederson and Schmidt-Nielson[34] could demonstrate no significant concentration of P^{32} in the cement-capped enamel surfaces of several teeth from two young girls who had been administered the

isotope several days previous to extraction.

The labeled phosphorus metabolism in the enamel of the dentition of rats was successfully investigated by Erbacher and Wannenmacher.[35] Their radioautographs of the teeth and bones of rats are excellent and worthy of note.

EFFECT OF AGE AND VITALITY ON DENTAL PHOSPHORUS METABOLISM

The radiophosphorus deposition in the bones and dental tissues of various experimental animals was also investigated by Volker and Sognnaes.[36] Evidence[37] was secured that the phosphorus metabolism of dental tissues declined with age. The dentin of teeth undergoing root resorption also revealed decreased metabolic activity. In a number of 3-months-old puppies and young monkeys, the hard tissues of unerupted permanent teeth disclosed phosphorus metabolic rates from five to seven times those of the erupted deciduous dentition.

Wassermann and his co-workers[38] found that the pulpless teeth of a number of adult dogs took up P^{32} at the same rate as comparable teeth with pulps injured by slight trauma, and demonstrated that the radio element distributed itself quickly throughout the dentin of non-vital teeth. Isolating the enamel from the saliva seemed to have no significant effect on the relative deposition of the isotope in that tissue. The amount of phosphorus derived from the saliva by the enamel appeared negligible as compared with that picked up through the dentin, either in normal or in pulpless teeth. Wassermann's data indicated that the dentin of a normal tooth took up about one one-hundred-thousandth, and the enamel about one ten-millionth of an injected dose of radiophosphorus.

The phosphorus exchange in the vital dentition of dogs varied from one to ten times that found in comparable non-vital tissues.[37, 38] Roots generally showed lower values than crowns. It would appear that the peridental membrane and the cementum were the chief source of inorganic phosphorus found in non-vital teeth.

VITAMIN D

Employing radioactive phosphorus, Dols and his associates[39, 40, 41] could discover no characteristic mode of action on the absorption or reexcretion of phosphorus in the gut of the rachitic rat. Differences between the rates of phospholipid synthesis in normal and in rachitic animals were not observed. The metabolism of the isotope in the bones of rachitic chicks, however, was more intense than normal. Cohn and Greenberg[42] fed vitamin D to rachitic rats and showed that the net absorption of radiophosphate from the gut increased 10 to 15 per cent. Although the lipoid phosphorus was undisturbed, the P^{32} content of the skeleton increased as much as 40 per cent. A specific effect of vitamin D on calcification, other than a mere increase in phosphorus absorption, was indicated. This concept was supported by the work of Morgareidge and Manly,[43] who observed the healing of the metaphyses of rachitic rat bones by the simultaneous appearance of a silver nitrate line and a significant increase in the P^{32} content of the bone.

PREGNANCY

Probably the first observations on the P^{32} metabolism of pregnant animals were made by Chievitz and Hevesy.[12] More recently, Manly and Levy fed disodium radiophosphate to thirty-one experimental and control rats. One group of experimental animals were mated two days after administration of the dose, another seven days after the dose. The retention of P^{32} in the mothers, controls and young led to the conclusion that when the mother is on an adequate diet, no significant exchange of inorganic phosphorus takes place between her skeleton and that of her offspring.

The effect of pregnancy on the radiocalcium and radiostrontium metabolism of mice has also been investigated.[55]

FLUORINE

The seeming importance of fluorine in the control of dental caries in man[45] and animals[46] led Volker, Hodge, Wilson and Van Voorhis[47] to reason that since caries begins on the surface of enamel, it would be important to explore the possibility that fluorides in solution were adsorbed to the surfaces of hard tissue crystallites, probably in the same manner as phosphates. *In vitro* experiments with enamel, dentin, bone and hydroxyapatite employing the radioactive isotope F^{18} showed that the radio element was adsorbed according to the Freundlich equation. They suggested that topical applications of fluoride solutions to the enamel surfaces of the teeth would result in the adsorption of fluoride by that tissue, thus rendering the dentition less susceptible to decay. Clinical research to substantiate this hypothesis is needed.

Wills[48] injected sodium radiofluoride in cats and found that it appeared in the saliva within one minute after the injection. However, less than 0.1 per cent of the dose was secreted in a twenty-one-minute experimental period. In parallel experiments, about four times as much Cl^{38} was detected in the salivary secretion collected over a similar period of time. The difference reflected a lower plasma concentration of fluoride, probably a result of its increased uptake by the calcified tissues.

Inorganic fluoride[49] was observed to apportion itself in the bones and teeth of experimental animals in much the same manner as phosphorus. Greatest deposition of F^{18} was detected in the actively calcifying portions of rat incisors. Plasma concentration of the radioelement fell rapidly with a corresponding increase in calcified tissue fluoride. Activity in any tissue was greatest in the proximity of circulatory elements. Attempted detection of F^{18} in enamel was unsuccessful, probably owing to the short half-life of the isotope.

SODIUM

Recently, Koss and Ginn[50] determined the distribution of sodium in the teeth and supporting bones of several dogs, using the radioisotope Na^{24}. Maximum deposition of the element took place twelve hours after injection of radiosodium chloride. In the same dog, the relative degree of uptake was fairly constant in the various calcified tissues. However, disagreement in uptake figures from dog to dog was great. Depositions in the teeth was roughly proportional to the size of the pulp. Dentin picked up nearly twice as much Na^{24} per gram as did enamel, although dog enamel normally contains twice as much sodium as does dentin.[51] Glycol-ash extraction of the hard tissues removed 90 per cent of their radiosodium content, this indicating that the organic matrix was chiefly responsible for the sodium intake. Extraction of the organic matrix in other experiments[52] removed only 5 per cent of the radiophosphorus content of calcified tissues.

CALCIUM AND STRONTIUM

Technical difficulties arising from a relative weakness of radiation have largely precluded the use of radioactive calcium in biologic experimentation. Nevertheless, Campbell and Greenberg,[53] and more recently Pecher,[54] have demonstrated that the affinity of the calcified tissues for calcium results in an accumulation of practically all of the isotope in the skeleton.

To surmount the difficulties associated with the employment of labeled calcium, Pecher[54] substituted in its stead Sr^{89}, a radioactive isotope of strontium. He showed that its selectivity in the animal organism was very similar to that of calcium, and proposed that it be used in the specific irradiation of calcified tis-

sues. Radioautographs of serial sections of the maxilla of a rabbit to which radiostrontium lactate had been administered indicated that the roots of the molar teeth contained the highest concentrations of the isotope, the cervical portions lesser deposits and coronal tips the smallest quantities of Sr^{89}.

Using Ca^{45} and Sr^{89} to study the mineral metabolism of calcium and strontium in pregnant mice, the Pechers[55] concluded that those elements probably migrate from the skeleton to the fetus during the last days of pregnancy. Radiostrontium lactate injected into lactating mice and cows was excreted in appreciable quantities in the milk.

SUMMARY

Artificial radioactive isotopes of elements important in the nutrition of calcified dental tissues have been found useful in dental research. Being radioactive, they are readily measured quantitatively, and easily distinguished from their stable counterparts in living tissues. By employing them as tracers, it has been found possible to demonstrate that the fully formed erupted tooth has a small but definite mineral metabolism. Information concerning the vitality of enamel and the various pathways of dental nutrition has been accumulated. Certain effects of vitamin D and pregnancy on the mineral metabolism of the skeletal tissues have been clarified. Preliminary studies using a radioactive isotope of fluorine have indicated a possibility that further investigation will lead to the establishment of a highly practical control for dental caries.

Since radioactive isotopes have proved themselves indispensable in overcoming the lack of physiologic reactivity inherent in dental calcified tissues, there is reason to believe that much vital information remains to be obtained through their additional utilization in the study of the teeth.

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RAPID ORTHODONTICS

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IN the April 1942 issue of THE JOURNAL is an article on "Rapid Treatment in Certain types of Malocclusion," by Bert G. Anderson, of Yale University, in which a presumably new method of rapid orthodontics is advocated; with the presentation of a number of experimental cases. The experiments were conducted on "patients with one or more anterior maxillary teeth in lingual version." An analysis of the article in question reveals many vague statements and a number of *non sequitor* conclusions.

Anderson's experiment consisted in passing brass ligature wires of 26 gage in a lingual direction about the necks of the malalined maxillary incisors. The loose ends of the wire were twisted and brought labially over the incisal edges of the mandibular teeth about which the same type of ligature wires had been tied with the loose ends extending in a labial direction. The twisted wire ends on the opposing maxillary and mandibular teeth were then united across the incisal edges, forcing the lingually malposed maxillary teeth over the incisal edges of the mandibular incisors. The patients were kept on a liquid diet until the wires were removed.

Of the nineteen cases treated in this manner, Anderson states that two were treated for two days and two for three days, eight required a week and seven "two weeks or less." Fifteen of the nineteen children thus treated had the jaws wired together for from one to two weeks. "This treatment," the author states, "was sufficient to bring the teeth into such relationships that movement toward normal positions followed." During treatment, patients visited the clinic four times the first week, three times the second week and then once a week for a period of one month. Thereafter, patients returned at intervals of six weeks, three months and six months. Three of the patients treated by means of wire ligatures subsequently required orthodontic treatment for "more complicated malocclusion." Seven of the treated cases had to be maintained by means of band-spurs and guide planes on the mandibular incisors. Thus, while the maxillary incisors were "jumped" rapidly,

it was necessary to continue treatment and observation to assure that the teeth stayed in their new positions for a comparatively long period.

An additional five cases were treated by means of bandspurs or guide planes attached to the mandibular teeth only. Such treatment required from one to several weeks, and "movement in some cases was slowed considerably." In spite of this heroic treatment, "no attempt was made to bring about the ideal mechanical occlusion which is commonly the goal of orthodontists."

The author does not make it entirely clear as to the amount of pain experienced by these patients. In one place, he says, "Patients were advised that they should expect some discomfort." He says further that the patients would bite or nibble at the wire in order to obtain "recovery of circulation in structures under the influence of a pressure that otherwise would not have been tolerated," and that "this was the kind of force employed in the movement of the teeth in these cases." He assures the reader, however, "that no excessive pain was observed in these patients."

The advisability of wiring together the jaws of a young child, forcing him to subsist on a liquid diet and to endure all the other inconveniences entailed, is questionable, and the procedure may have serious consequences. For example, an attack of vomiting, especially when the patient is alone, might have dire consequences, including death through strangulation.

A description of the method of John Tomes, F.R.C.S. of London, who employed a "rapid" method of correcting irregularities of the position of the teeth by twisting them in their sockets by means of an extraction forceps is contained in the minutes of the Odontographic Society of Pennsylvania[1] for December 5, 1865. Garretson and Flagg, two of the outstanding men who have graced the dental profession, among others, discussed Tomes' method. Garretson pointed out that "temperament would appear to contra-indicate it in many cases; anatomical peculiarities in the fangs of the teeth would also, in other instances, present obstacles insurmountably adverse to the performance." He continues: "It would also seem to be true that the internal vitality of such twisted teeth would be very much risked." Flagg commented that he regarded the practice as "so old fashioned as to become obsolete; the practice of 'transplanting' and 'forcible torsion' were among the accomplishments of dental practitioners of 50 years ago." (These words were spoken in 1865.) He objected to the violence done the parts through forcible torsion.

Anderson's basic philosophy of "rapid treatment" is therefore not new, nor have the objections expressed over three-quarters of a century ago been overcome. Contrarily, added objections to forcible, rapid tooth movement are now recognized in the light of our newer knowledge of histology and physiology.

Anderson, who is a research worker in the field of orthodontics, is impressed by the fact that no one has doubted "the validity of the concept of a physiologic rate of tooth movement in orthodontics." This is a theory which was long ago exploded. Physiologic tooth movement can occur during mastication only. The teeth return to their original position when the pressure of mastication ceases, except when the teeth shift as a result of loss of proximal contact through extraction or proximal decay of adjacent teeth.

Orthodontic tooth movement depends on the constant application of a force in a desired direction which brings more or less continuous pressure on the periodontal membrane, resulting in bone changes whereby the biologic width of the periodontal membrane is restored and the tooth is moved in the direction of the exerted force. Excessive pressure, such as might be caused when the teeth

are wired tightly together, can result in trauma of the periodontal membrane when a tooth is brought in direct contact with the adjacent cortical layer of the alveolar bone. Thus, while the tooth may appear to have been rapidly moved, release of the excessive pressure usually allows the tooth to return to its former malposed position. Anderson confuses muscular contraction within physiologic limits with the excessive pressure which he produces on the periodontal membrane of the teeth of those children whose jaws he wires together. In the case of children so treated, a rest period is indeed necessary to overcome the traumatic injuries which excessive pressure can produce.

Schwartz, Oppenheim, Gottlieb, Orban, Kronfeld and others warn against excessive tooth movement, pointing out that injury to the teeth because of "rapid orthodontic treatment" can result in periodontal injuries, devitalization of the pulp and root resorption. While injuries to the periodontium may not be permanent, root resorption and pulp devitalization are always permanent. That is not to say, however, that microscopic or, to some extent, even macroscopic root resorption which does not affect the stability of the teeth need necessarily interfere with tooth function when orthodontic treatment is discontinued.

Korkhaus, Lewis and others have pointed out that, after the premature loss of the deciduous molars, children will place the jaws in such a position as to bring the maxillary incisors in lingual occlusion, in order to obtain greater masticating efficiency. This false relationship can easily be recognized when the patient's head is held backward as far as possible and pressure with the palm of the hand is exerted on the mandible until the jaws are approximated. Correct placement of the mandible will bring the anterior teeth into normal relationship. It has been shown that many cases of self-correction of lingual version of maxillary incisors will take place when there is no true macromandibular development as the dentition develops. Hellman,[2] in a recent article, presents a case of Class III malocclusion which he corrected in a period of three weeks by the use of a simple wooden tongue depressor held by the patient in such a manner as to bring leverage on the maxillary teeth with the incisal edges of the mandibular incisors serving as a fulcrum. This method, which has long been known not only to orthodontists, but also to dentists in general practice, does not entail the pain or the dangers attending the method employed by Anderson.

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HOW TO INTEREST DENTISTS IN THE DENTAL HEALTH PROGRAM

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THE average dentist's interest in the health program is in direct proportion to the responsibility that he is willing to assume, both as an individual and as a member of his dental society, for the promotion of dental care for the people of his community. Dentists are naturally concerned with their own practices and not with the lack of dental service for people generally; and dental societies, after all, are simply associations of men with individual practices. All of these men need to discover at first hand the significance of the problem in their own field, in their own community, and until they recognize that they have problems and are willing to spend time and effort in analyzing them and developing ways and means whereby solutions can be developed, we cannot expect them to have any genuine or lasting interest in the dental health program.

It is easy to whip up enthusiasm and interest on the part of dentists or dental societies for specific programs that are not of long duration, such as the examination of school children at infrequent intervals, but to develop the interest that is necessary for the type of programs that we are concerned with requires careful study of the problem by the individual dentist in his community and by the dental society, periodic planning with evaluation of results, the maintenance of high standards of technic and cooperation with related agencies. This must be an active interest and must continue year after year. There can be no let-down or the entire program will slip backward in direct proportion to the activity and interest of the dentist. All of our dental health programs today are dependent on the regular supervision of the child's dental health, whether in the office of the private practitioner or in the clinic. Failure on the part of the dentist to maintain this interest and to do his part causes more damage to the dental program than any other single condition. Many programs backed by well-intentioned dentists and dental societies have been ineffective because of lack of interest on the part of the individual dentist and his consequent unwillingness to assume his rightful responsibility either in his community or in his private practice.

Is anything more tragic, as far as the dental health program is concerned, than to have the teacher develop an interest on the part of the child and the parent in visiting the dental office or the clinic or to have the public health nurse interest the mother of the preschool child in initiating early dental care for her child, and then to have the child receive only a cursory examination on arrival at the dentist's office and the mother be informed that "those are only baby teeth."

Organization is the first thing necessary to develop the dentist's interests. Some societies are well organized, other organized only nominally and some not organized at all. For local leadership to have

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Read at the fifth annual meeting of the American Association of Public Health Dentists, Houston, Texas, October 26, 1941.

effective channels for expression and for acceptance of responsibility, well-organized societies are essential. Team-work does not result automatically from formation of the organization. Individuals can function effectively only after they have learned to recognize common problems as a challenge to cooperate, rather than as opportunities for competitive action. Dental health programs require group action. Group action calls for a common purpose and agreement as to the problem and method.

Those who are in administrative positions and have responsibility for the development of community dental programs generally have a groad social outlook regarding the objectives and the desired end-results. There is a great difference, however, between their broad social understanding of the needs of the community and those needs that will be recognized by the dental society. It is essential, therefore, that, in the developmental stages, steps be taken carefully and slowly, always with the end-result in mind, with the realization that education is a slow process, and for it to be effective, the dentist must have a chance to participate and work out the solution to his own problems.

In the program with which I am most familiar, our early relations with the dental society were simple and direct. In the communities concerned, well-organized county health departments served as the coordinating agency, through which the dental society and related groups could pool their resources and plan cooperatively in the development of a more adequate health service for their communities. Such an administrative unit is essential to guide and to provide leadership, as well as to assist in the analysis of problems and the evaluation of the program. Dental societies in this particular area were organized and the general needs of the people were discussed. These needs, because of the fact that no adequate survey had been made concerning the specific problems in the community, were expressed in general terms, to the effect that 80 per cent of the population were not availing themselves of dental service owing to a lack of information as to the value of dental service and the lack of money wherewith-all for dental care.

It was agreed by these dental societies that they would cooperate with other related health agencies in the community in formulating a program to create a greater demand for dental service in their community and to provide this service when the demand had been created. A third basic decision made at this time was that any program initiated should provide service for all the people of the community and not just for those of the low income group or those who, because of economic necessity, would probably always depend on outside financial assistance to solve their health problems. In the past, most of our planning for dental care has been concerned primarily with service for the lower income groups, no serious attempt being made to develop programs for all the people of a given community.

To create an understanding, on the part of the dentist, of the problem in his community, a simple school examination was developed whereby each dentist would have the opportunity of examining the children in his community. This examination provided the dentist with an opportunity to assume certain responsibilities for the education of community groups, such as school superintendents, school commissioners, teachers and parents. The results of the examination, which served as the baseline for study of the problem in each community, pointed out definitely the need for an adequate service program. This examination also pointed out to the dental society the necessity for cooperation with other groups if an effective educational program was to be developed. It was essential that the teachers, the school super-

intendents, the physicians, lay leaders, the press and many others assume responsibility for the education of the child and the parent in preparation for the program, since the individual attitude toward dental service involves the attitude and opinion of many persons other than the dentists. Plans must take into consideration the multiplicity of these forces and the variation of their direction and intensity, and the fact that they sometimes supplant one another, sometimes conflict. A well-designed program of, or for, any group may be handicapped by the indifference or opposition of one or more of the others. A problem as complicated as this can be approached effectively only by being resolved into its component parts. Each of these parts can then be attacked separately, but a coordinated plan is necessary to bring about a unified community attitude.

The health department assumed responsibility for the scheduling of the examinations in the various schools, for the organization of meetings which gave the dentists an opportunity to provide the teachers with facts to be passed on to the child to facilitate functioning of the program.

As a result of this examination program, a new problem and a new interest evolved. The dental societies realized the need for a service program, but recognized that, with the manpower available, it would be impossible to provide for correction of all defects found. Planning and study were necessary to determine how to use their time most effectively and to develop a long range program which would eventually provide dental service for the entire community. The economic aspects of the program had to be considered at this time, and what patients were eligible to receive financial assistance had to be determined. These problems required consideration on the part of each group, a new problem, with an increase in interest.

The service programs were developed. As would be assumed, they were planned in a manner to provide continuous dental care for children in the early age groups, with the hope that if the program could be continued over a long enough period, the tremendous problem of care for adults would eventually be eliminated.

As the number of service programs increased, another major problem was brought into focus. The dental groups discovered that in order to provide the type of service essential to a program of this type, additional information was needed regarding the technical procedures required in their practices. As a result, they studied various ways and means of developing programs of postgraduate and continued education for themselves and the society as a whole. These programs first took the form of lectures and demonstrations. Finally, two-week postgraduate courses were developed and a plan was formulated by each of the groups that would provide not only opportunities for study away from their offices and in their societies, but also consultation in various fields in their offices, on their own office problems. Here, again, a new program was developed which increased the dentist's interest in the dental health program.

This educational program served many purposes other than that of providing the dentist with newer technics. It developed an understanding among members of the group. A group cannot meet for two-weeks' study together and not find out that the man across the street is a pretty good friend after all. These courses also provided an opportunity for further discussion of common problems.

As the program developed, it became necessary that the dental society, from time to time, evaluate their accomplishments. Office records were found to be inadequate, and the combined records of the society did not provide information as to the number of preschool children and school children who were availing

themselves of dental service. They did not show the effectiveness of the program in one area as compared to that of another area—information that is essential for proper administration of the program. As a result, committees were appointed to develop a new record system to provide uniform information to the county health department, which was to tabulate this information in a manner to present the problem by areas and the accomplishments to date. By adoption of uniform records, the dentists each day were able to collect information essential to furtherance of the dental health program. With this information, they had a sound basis for the discussion of program trends, which often resulted in a change of emphasis and development of new technics of administration and education. These records also assisted in assuring the continuous supervision of the children of the community and, when integrated into the health department records, provided a more nearly complete picture of the health status of the community.

Such planning and procedure as I have outlined naturally increased the dentist's clientele, and thus increased his income; which probably did more to develop his interest in the program than all the other factors concerned. The saying "The thing nearest to a man's heart is his pocketbook" is all too true.

All of us here believe that a philosophy of public health, which includes the social implications as well as the economic, is the basic need of the profession today. We need to recognize the implications of our present programs, to appraise them in terms of fundamental objectives, in order that the expanding service that we must develop in the next few years shall serve as the broad foundation for the future. We are all too likely to expand in the easiest way, only to find later on that we must rebuild from the ground up.

In a democracy, we accept the hypothesis that it is not enough to provide a service: we must understand the value of that service or it will not long be maintained. We say that we abhor life under a dictated economy—that it means little to save lives if we cannot live them—that we value freedom of action, freedom of thought. Is this true? Or do we prefer freedom from painful thinking, freedom from responsibility?

In health departments and in school systems, we say that we hate dictators in one breath and in the next that we want health programs under our immediate control. Yet we know that eventually we must have the determined cooperation of the profession. When people really desire proper care, the demand will tax the supply. Service, after all, is rendered by individuals, not by departments, by people or by systems. No matter what the ultimate solution of the economic phases are to be, the work must still be done by dentists.

We need more faith in the democratic process, not less. We should worry more about doing our share well, less about who gets the credit. True leadership lies in performance and not in insistence upon recognition. True interest results from careful analysis of the problem and a willingness to do something about it.

Until we, as dentists, can work out a program for the health of all the people, the least we can do is to make our present effort consistent with that aim. We need no less emphasis on national and state plans, but more emphasis on local plans. Let us try, with all the ability that we possess, to assist in solving the problems that confront us at home. Let us try to see these problems clearly. Experience gained will better prepare us to plan and cooperate on a national scale for whatever lies ahead.

DENTAL PHOTOGRAPHY

By GABRIEL R. VOGELSON, D.D.S., New York, N. Y.

MANY dentists desire to develop a technic for dental photography, but are deterred from venturing into the field because of a feeling that the subject is too complex. This is not the case, and if the dentist takes each step separately, he will find that the process is not nearly so complicated as it seems. The results are very gratifying and warrant close study. I shall explain, as simply as possible, the basic principles involved in dental photography, from the choice of a camera to the development of the printed picture.

CHOICE OF CAMERA

Following are the requirements of a camera for dental purposes:

1. It must be possible to focus on an object from 6 to 12 inches from the lens; which demands a double extension bellows.

2. It must be possible to use one film at a time.

3. It must be possible to focus this on an object with pinpoint clarity.

4. The film must be large enough not to require enlargement.

5. It should be possible to hold a Kodachrome adapter on the back of the camera for color films.

6. The camera must not be too bulky or clumsy.

7. The lens of the camera need not be a fast one, but must be anastigmatic and have a good depth of focus; that is, the object should be clear, not only at the point of focus, but also in the area radiating from that point.

The cameras best suited to dental use are (1) Ihagee (German make); (2) Zeiss-Icon (German make); (3) Kodak Recomar, and (4) Kodak Medalist.

The $3\frac{1}{4}$ by $4\frac{1}{4}$ or $3\frac{1}{2}$ by $4\frac{3}{4}$ sizes are suitable. A second-hand one will serve the purpose and be less expensive.

If any camera does not meet the requirements listed, it will not be satisfactory for dental purposes. If one can obtain a ground-glass focusing device called a Speedacopy, which enables one to photograph an object in sharp focus, he can use a miniature camera, which would be satisfactory for color photography. Black and white prints, however, have to be enlarged to the desired size.

CHOICE OF FILMS

There are two groups of films which are used in dental photography:

1. The non-panchromatic group. These films are not sensitive to red, green or orange, and will not filter out those colors. Although here we are primarily discussing black and white pictures, objects having the above-mentioned colors will be darker and thus stand out more clearly. This group of films is used generally for pathologic conditions, such as pyorrhea, chancres, decay of the teeth, gingivitis and Vincent's infection, and for photographing gold bridges, gold inlays and acrylic and vulcanite dentures.

The films used in this group are called the supersensitive portrait and the par speed portrait.

2. The panchromatic group. These films are sensitive to red, yellow, orange, green and blue. Consequently, objects of these colors will not stand out so darkly as they would if a non-panchro-

Lecture given at the Greater New York Dental Meeting, December 5, 1941.

matic film were used. This type of film is used in portrait work when it is desired to reduce facial blemishes, as in orthodontia or bite-raising cases, or when esthetic results have been achieved, as in porcelain jacket or denture cases. (Fig. 1.)

The films used in this group are super XX or portrait panchromatic. I prefer the super XX because it is a faster film and therefore requires less exposure.

Plaster models can be photographed with any type of film.

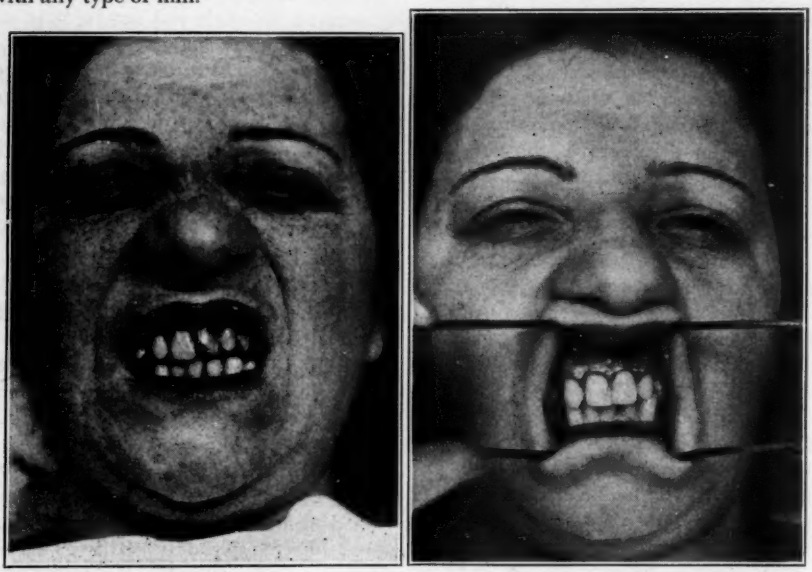

Fig. 1.—Left: Print of non-panchromatic film showing decayed central incisor. The subject's yellow freckles stand out with an unpleasant effect. Right: Print from panchromatic film used after construction of porcelain jacket crown. The freckles have been eliminated, a more pleasing facial effect resulting.

LIGHTING AND EXPOSURE

For black and white photography, No. 1 photoflood bulbs are used. The apparatus used for lighting the object is either a Kodak light unit (Fig. 2) or a homemade one. This unit rests on the bracket table and the patient is seated in the dental chair, which is raised to the proper height. The procedure is very simple, eliminating the need for a separate photography room and clumsy apparatus. The homemade light unit is simply two 2 by 18 inch pieces of wood fastened together in a T shape. The horizontal and vertical pieces should be long enough to extend a little beyond the sides of the bracket table. At each end of the horizontal wood strip, a 2-foot length of flexible metal tubing is attached. At the ends of the tubing, a socket is screwed on and the bulb and reflector are positioned. Metal wiring, to which is attached a diffusing screen if necessary, is extended to the reflectors. On the vertical strip of wood, a piece of rippled rubber cut from a rubber bath mat is placed so that the camera, which rests on it, will not slide. The background can be black, medium gray or khaki and should be about 3 feet back of the patient. I use a black window shade, which is hung on the x-ray ma-

Fig. 2.—Kodak light unit.

1. For portrait work, a diffusing screen of No. 1 tracing paper covers the lights to soften them.

2. No diffusing screen is used for intra-oral work.

3. For facial portraiture, the use of two lights of equal intensity and equidistant from the object gives a flat appearance to the face. This is used where a strictly scientific picture is wanted, and when other pictures with the same lighting effect are required in the future.

4. If a more artistic picture is desired, the so-called 45 degree angle lighting arrangement is used. One light, covered by three or four sheets of No. 1 tracing paper, is placed just to the rear of the lens. The other light, with one sheet of tracing paper covering it, is placed about 45 degrees above and to the rear of the face. This gives an uneven light to the

Fig. 3.—Poor application of background, in case of construction of new dentures. At the left, the white background was too close to the subject, a shadow resulting on the background. In the view on the right, the background was farther back. In neither of the pictures did the background employed extend over the entire area back of the subject.

chine placed back of the operating chair. (Fig. 3.)

BASIC PRINCIPLES IN LIGHTING

The following are principles to which we must adhere:

Fig. 4.—Left: Poor position of head, poor focus and flat appearance of face due to improper lighting. Right: So-called 45° light arrangement; showing third dimensional effect of face, sharp focus and proper position of head.

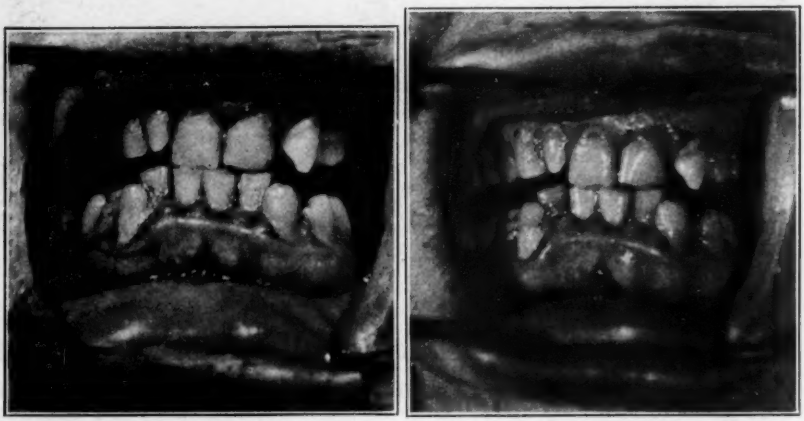

Fig. 5.—Left: Effect of placing lights too near center of face; showing lightening of inflamed gingiva. Right: Effect when lights were moved more to side of face, this creating shadow about gingiva and bringing inflamed area into perspective.

face, bringing out its highlights, and gives a third dimensional effect.

5. If there are too many wrinkles under the chin, a reflector (white cloth covering a book) is held below the chin by the patient. This reflects the light into that area and eliminates some of the shadows caused by the wrinkles.

6. In intra-oral photography, emphasis on the redness of the gingivae as in

pyorrhea, etc., is obtained by positioning the lights so as to cast a shadow in the desired places.

7. The smaller the lens opening, the sharper the focus on the object. Consequently, we close the opening of the lens as much as possible, but not so much as would require a longer exposure than one second.

BASIC PRINCIPLES AS RELATED TO THE SUBJECT

1. For full view, eyes should be parallel to the floor. An imaginary line connecting the orbitalia points is drawn, and this should be parallel to a line drawn horizontally on the focusing device of the camera.

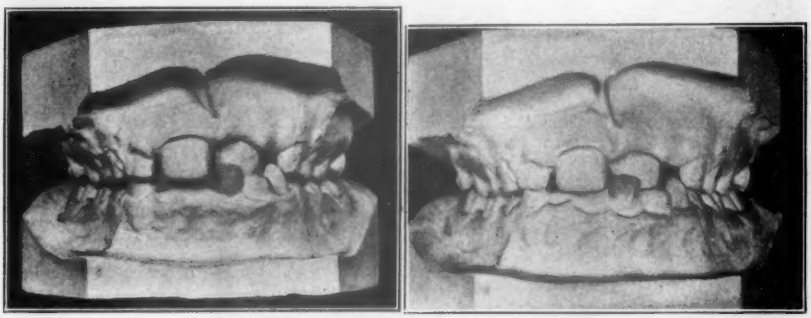

Fig. 6.—Case of malocclusion in which it is desirable to bring out lingual version of central incisor. In the picture on the left, the lights were placed high up, a loss of contrast between the upper left central incisor and the opposing lower tooth resulting. In the picture on the right, the lights were brought lower, the shadow on the lower tooth resulting in an increase of contrast between the two teeth in question.

2. For the profile view, the head should again be parallel to the floor. A line drawn from the tragus point of the ear to the orbitalia point should be parallel to the above mentioned line.

3. The vertical position of the head should be in line with the vertical line drawn on the focusing glass of the camera.

4. For orthodontia purposes, the hair should be brushed back of the ear.

5. Glasses should be removed. If this is not done, the head should be bent down until lights are not reflected in the glasses.

6. The size of objects on pictures should always be the same. The distance between lens and face is measured and recorded. If a separate room for taking pictures is used, the spots where the tripod and chair are positioned should be marked.

For portraits in orthodontia or bite-raising cases, the flat lighting system is applied, using a diffusing screen over the lights. Eyes are parallel to the floor, lenses are level with the eyes and focused on the eyes. Panchromatic film is used, super XX. The exposure is either half a second with a lens opening of F8 or one second with the lens opening of F11. With the portrait panchromatic film, the exposure is one second at F8 lens opening.

For pyorrhea, Vincent's infection or gingivitis cases, the lights are placed on each side of the lens, before the face, but not too near the center. If we bring the lights too near the center, the pathologic condition will not stand out sharply. The lenses are level with the teeth and focused on them. (Fig. 5.) No diffusing screen is used. A non-panchromatic film is employed, either a supersensitive portrait or par speed portrait at an exposure of one second with an F8 lens opening or two seconds with an F11 opening.

For jacket crowns, the rules for portrait work apply.

In photographing bridgework, it is best to dull the glare of the gold by dabbing moldine or putty on the shiny surface. A diffusing screen is used to prevent a reflection of the bulbs in the picture. A non-panchromatic film is used, supersensitive portrait or par speed portrait. The time exposure is seven seconds with an F 32 lens opening. We do not have to watch the clock. If we count 1001, 1002, 1003, etc., each number represents a second.

Fig. 7.—Esthetic dental achievement that could be properly recorded only by means of photography.

The lighting arrangement for plaster models depends on the type of occlusion present. In Class I occlusion, lights should not be placed in front of models,

but rather in a position to create sufficient shadow about the malpositioned teeth. (Fig. 6.) In class II occlusion, one light is near the lens and the other is high enough to create sufficient shadow to emphasize the distance between the upper and the lower anterior teeth. In Class III occlusion, lights should be brought lower to create the shadow between the lower and upper anterior teeth. Models and other similar objects are placed on a black horizontal board attached to a vertical board. This board is placed on the dental chair, which is raised to the necessary level. The lighting unit is on the bracket table, the camera resting on the table while the picture is being taken.

DEVELOPING OF NEGATIVES

The equipment necessary for the developing of negatives is (1) a time clock, (2) developing tank, (3) thermometer, (4) quart graduated pitcher, (5) funnel, (6) clips, (7) developing solution "DK 50" and (8) fixing solution.

The negative is removed from the film holder and placed in the developing tank. If the negative is a non-panchromatic film, the red light can be on. If it is a panchromatic film, absolute darkness must be obtained. I use a tank from which the top is removable. After the negatives have been placed in the tank and the top has been replaced, lights can be turned on. The developing solution is then poured through the top into the tank. At 65° F., it should take about 10 or 12 minutes to develop the negatives, after which the solution is poured back into the brown bottle and the tank is washed with cold water two or three times.

The fixing solution is poured into the tank and remains there for twenty minutes. The negatives are removed and washed in cold water for half an hour and then hung up to dry. In developing the negatives, the tank should be agitated two or three times during that time to prevent bubbles on the negatives, which may spoil them.

A developing solution can be made of one part x-ray solution and two parts water. In developing pictures for models or bridges, where sharp lines are desired, the straight x-ray solution can be used.

PRINTING OF NEGATIVES

The equipment needed for printing is: 1. Three porcelain trays, one to contain D72 developing solution, the second water and the third fixing solution. 2. A printing box or frame. 3. A 50 watt light. 4. A squeegie board (chromium plated). 5. A rubber roller.

The paper used for printing our pictures is Azo F glossy contact print, single weight. A glossy paper is preferable in that the picture is sharper. This paper comes in four grades, Nos. 1, 2, 3 and 4. Number 1 is used for overexposed negatives, No. 2 or No. 3 for normal and No. 4 for underexposed negatives.

The negative is placed in the printing frame, with the shiny side touching the glass and the contact paper placed over that. The back of the printing frame is clamped down and then the glass part is exposed to a 50 watt light, at about 6 inches, for six seconds. Then the light is switched off and the contact print paper is removed from the frame and placed in the developing solution with a sliding motion. This permits the paper to be developed evenly. When the object photographed appears on the paper and begins to get dark, the print paper is removed, washed in water and placed in fixing solution. After a minute, the light is turned on and we can then determine whether we have allowed the paper to remain too long or too short a time in the developing solution. The paper is allowed to remain in the fixing solution for fifteen minutes, washed for a half an hour and pressed onto the metal squeegie board with a rubber roller. When it is dry, it can be peeled off the board. The

squeegie board, when dirty, can be cleaned with a solution of 1 part kerosene to 2 parts benzine. This is a good cleaning liquid and its use prevents the prints from sticking to the board.

For color photography, the Kodachrome adapter is used on the back of the camera with a K134A, 36 mm. indoor film, No. 1 photoflood with same reflector as for the black and white pictures. The lights are placed on each side of the lens and the exposure is one-fifth second at an F 18 opening. The K 135A film is used for indoor work where there is not total darkness. It is best to pull down the blinds so as to eliminate some of the variables caused by daylight. There are two types of Kodachrome adapters that fit the backs of the cameras mentioned. It is preferable to obtain the bantam size as that holds only eight films instead of eighteen.

All this procedure may seem difficult at the beginning. However, I have left out all unnecessary procedures, so as to boil the whole process of dental photography down to a simple technic.

230 Central Park West.

CLASSIFICATION AND ETIOLOGY OF PERIODONTAL DISEASE

By JOHN OPPIE MCCALL,* D.D.S., New York, N. Y.

DISEASES of the supporting tissues of the teeth have been difficult to classify because of the almost limitless number of variations in the clinical conditions coming under this heading. Etiology too has been found to be very complex; and since etiology must be considered in developing a classification, the confusion which has existed in each one of these phases of periodontology has, to say the least, not assisted in the clarification of the other.

Histopathologic evidence, which should assist greatly in developing a clear conception of types of disease, has not given the total aid desired. What is needed is the histopathologic evidence plus the evidence provided by a continuing study of clinical facts. The less complicated the clinical case being studied, the greater the certainty with which deductions can be drawn.

Thus the study of periodontal disease in children is of great value. From this standpoint, I have been fortunate in having the opportunity to see a large number of such cases at the Guggenheim Dental Clinic during the past ten years. Cases of periodontal disease in its earliest stages have been observed, also cases of advanced disease. Usually, these cases have presented a minimum of complicating factors.

Time will not permit mentioning or discussing all of the classifications proposed in the past. Kronfeld has given a good summary of the more important of these.[1] It is interesting to note, in the comparison of the various classifications, the variation in nomenclature as well. In fact, controversy in the later field has overshadowed the discussion of classification.

Before we can arrive at a decision as

Read before the Section on Histology, Physiology, Pathology, Bacteriology and Chemistry (Research) at the Eighty-Third Annual Meeting of the American Dental Association, Houston, Texas, October 29, 1941.

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to what the types of periodontal disease are, we should determine what tissues are fundamentally affected; and the mode of progression from one tissue to another.

It is my belief, based on clinical observation and on histopathologic evidence, the later derived from numerous sources, that there are two fundamental types of periodontal disease and that the tissues first affected are, in one type, the alveolar bone; in the other, the gingiva. For disease beginning in the alveolar bone, I propose the name progressive alveoloclasia. For disease beginning in the gingiva, I accept the name gingivitis, previously proposed. These diseases are more often than not superimposed one on the other, different cases showing the varying proportions or influence of each. At the same time, they are two distinct entities and, to a remarkable extent, independent of each other in origin. That is, progressive alveoloclasia is not caused by gingivitis, nor is gingivitis caused by progressive alveoloclasia. Furthermore, either can exist for long periods without evidence of the existence of the other.

Naturally, if either alveolar bone or gingiva becomes the site of disease, the other tissue will tend to be involved through the derangement of their closely related blood supply. This is true also of the pericementum, which will, however, be secondarily attacked in either case.

PROGRESSIVE ALVEOLOCLASIA

Progressive alveoloclasia is a progressive resorption of the alveolar bone, beginning usually at the crest of the process, but tending soon to involve the inner wall or lamina dura of the socket. As stated before, it is not caused by or directly related to disease of the gingiva or the pericementum. However, it necessarily causes degenerative change in the pericementum as it progresses and thereby undermines the gingiva. This in turn tends to make that tissue susceptible to infection. If infection develops in the gingiva in such a case, pocket formation follows. The disease thus produced corresponds to Gottlieb's diffuse alveolar atrophy in that the alveolar bone is the tissue primarily affected. As I understand it, Gottlieb attributes this condition to metabolic or other systemic aberrations. Kronfeld, on the other hand, proposes two types of alveolar atrophy: Gottlieb's diffuse type, caused by systemic conditions, and an alveolar atrophy, caused by excessive occlusal stress.

In my opinion, there is only one kind of alveolar resorption. I call it progressive alveoloclasia because it is not spontaneously arrested, nor is it subject to repair except through treatment. I think that in nearly all cases of progressive alveoloclasia, there are both systemic and local etiologic factors. These may be present in widely varying proportions in different cases. In some cases, the systemic factor is obviously the dominant one; in others, the etiology may be almost entirely local.

It will be noted that I follow rather closely the type called diffuse alveolar atrophy by Gottlieb and by Kronfeld. However, I believe that this term is inappropriate. In the first place, the process is not diffuse, I believe, but localized. In addition, I question the application of the term atrophy to a process that often has, in part, a traumatic etiology. It is for these reasons that I suggest the term progressive alveoloclasia.

The examples of diffuse alveolar atrophy submitted by Gottlieb[2] are not convincing as regards their systemic origin. To me, most of these cases represent unusual, but nevertheless definite examples of the effects of occlusal overstress in the presence of unusually resistant alveolar bone. In some of these cases, periapical disturbance occurs; in others (seen more often), migration takes place. In these cases too, an important angle is the resistance of the gingiva to

infection, pocket formation being absent or progressing very slowly.

Progressive alveoloclasia, as I conceive it, also corresponds in many respects to Box's periodontitis complex. However, in describing it, Box gives as the order of progression rarefying pericementitis fibrosa, leading to destruction of alveolar bone, followed by infection which involves the gingiva. This, by extension, causes infection of the pericementum and, in the late stages, infection of the bone. I have reached the conclusion that the lesion of the periodontal membrane, called by Box rarefying pericementitis fibrosa, is secondary to bone resorption instead of being the cause of it. Also, in periodontitis complex, Box tends to put the emphasis on local etiology. There is, I think, a very important, although as yet unknown systemic factor to be found in nearly all these cases. One reason for this belief is the fact that traumatic occlusion, on which I have laid, and still lay, much emphasis in this type of disease, does not always cause either alveolar resorption or pocket formation, but, in many cases, results in pulp disturbance. There must be a certain systemic influence together with the traumatic occlusion in most of these cases before progressive alveoloclasia can occur. On the other hand, in some cases, extensive alveolar resorption and pocket formation may occur in a case in which the occlusion exhibits such slight deviation from the normal that it would ordinarily be innocuous.

One type of case in which this systemic influence is very obvious is that occurring in the mouths of children and young adults who as infants have had rickets and who have, among the stigmata of rickets, hypoplastic enamel of the first permanent molars and the permanent incisors. Bone resorption and pocket formation, especially severe around these teeth, are often found. Gingival inflammation, although present, is not, apparently, severe enough to account for the deep pocket. This condition does not occur in every case of hypoplasia of enamel of the permanent teeth; on the other hand, it seldom occurs except in hypoplasia of the enamel.

Another type of progressive alveoloclasia sometimes occurring in the child's mouth should also be mentioned by way of contrast. In this type, the early history is good; the enamel is well formed, and there is evidence of adequate if not superior bone resistance. These are the cases in which, for example, an upper incisor bites lingually from one or more lower incisors, the other upper incisors having the usual labial overbite. Usually, in these cases, the lower incisor exhibits a moderate alveolar resorption on the labial side together with gingival inflammation and recession. There is only the shallowest pocket. The lower incisor is usually slightly mobile. Here, there is no doubt of the existence of traumatic occlusion; also, there is no doubt that this traumatic occlusion is the most important etiologic factor in the case. However, we are inevitably reminded of the element of bone resistance when we see that, in spite of the constant pounding to which the tooth is subjected, there is less bone resorption than in the type of case previously described.

Thus we see that alveolar strength varies from case to case, and even in the same case from time to time. Alveolar bone may withstand heavy occlusal stress in one case and in another will fail to survive what may appear to be quite normal occlusal demands.

May I here be permitted a further brief excursion into the subject of nomenclature? The term traumatic occlusion is well established in periodontal literature, and what periodontists mean by that term is well understood. However, there are two situations in which the term may at present be applied. Stillman and I recognized this duality and defined traumatic occlusion[3] as an "abnormal occlusal stress which is capable

of producing or has produced an injury to the dental or periodontal tissues." In other words, we saw that occlusal relations may exist which are potentially harmful, but which, because of superior tissue resistance, have not caused injury at the time that the case is observed. We noted this in addition to the conditions in which the abnormal occlusal relations have already caused damage. I now suggest that this situation be clarified by the introduction of a term for each condition. Box[4] has introduced the term traumatogenic occlusion to signify what periodontists have previously called traumatic occlusion. Rather than use it in that sense, it would, I think, be helpful to apply Box's term to the occlusal relations that are potentially harmful, and the term "traumatic occlusion" to the occlusal relations in cases in which injury to dental or periodontal tissues is already in evidence.

GINGIVITIS

The other fundamental type of periodontal disease that I recognize is gingivitis. I subdivide this into simple and rodent gingivitis, the latter a type which, by virtually an erosive action, causes a breaking down of the subgingival tissue. Simple gingivitis is an inflammatory condition involving the gingiva only. It has a tendency to develop into the rodent type unless cleared up by spontaneous disappearance of the cause or by treatment. However, simple gingivitis may remain as such for long periods of time where resistance to extension is high.

Simple gingivitis is exemplified by the forms of gingivitis induced by local irritants, also by gingivitis due to unbalancing of sex hormones, by scorbutic conditions, etc. Thus, it may be either local or systemic in its origin. It may occur in a clean mouth as well as in one not properly cared for. Because of its possible varied origin, Gottlieb's term schmutz pyorrhea is not applicable to this type. Nor is that term properly applicable to the rodent or erosive type of gingivitis, which may or may not be caused primarily by accumulation of foreign material in a neglected mouth. In fact, the accumulation of foreign matter may follow the gingivitis, causing further inflammation.

The bone resorption which is a part of this disease occurs not as a result of the gingival inflammation, but as a result of some systemic condition, and comes under the heading of progressive alveoloclasia. Thus, in cases of this type, there are two diseases proceeding side by side. Either one may influence the course of the other. The disease starts at the alveolar crest and works toward the apical region. Progress is usually slow, but, in some cases, if function is absent and the bone thus lacks the resistance ordinarily developed by functional use, resorption may be very rapid, and usually on only one side of the root. In such cases too, resistance of the gingival tissue as well as of the pericementum may be low with the result that a considerable recession of the gingiva may occur on the side that had undergone alveolar resorption. This type is occasionally seen in the lower incisors of children who cannot or do not bring the upper and lower anterior teeth into contact.

While on the subject of gingivitis, attention should be drawn to the fact that not all chronic gingival inflammation results in lysis (breaking down) of this tissue. In many instances, especially in childhood, the reaction to the injurious agent is hypertrophy of the marginal gingiva. This is commonly seen in the young patient in even so potentially destructive a condition as Vincent's gingivitis. Pus pocket formation is actually a manifestation of this tendency of the marginal gingiva not to undergo lysis, as will be noted presently.

LYSIS OF THE PERIODONTAL MEMBRANE

There is next to be considered the question of pocket formation and pro-

gression and that of gingival recession. Pocket formation is essentially the result of a breaking down of the tissue immediately adjacent to the tooth, beginning at the base of the gingival crevice, with the persistence, in more or less its original position, of the external tissue; namely, the marginal gingiva and alveolar mucosa. Gingival recession differs from this in that the overlying and the deeper tissues undergo equivalent lysis, with consequent maintenance of a shallow gingival crevice.

Regardless of which process occurs, our chief concern is with the alveolar resorption which must precede this process of soft tissue lysis. It is important to realize that the initial breaking down of the soft tissues when pocket formation begins is not in the periodontal membrane proper, but in the degenerated tissue into which the periodontal membrane becomes converted after bone resorption of some degree has occurred. Weinmann[5] has brought out this fact very well, and I have been convinced for some time that this is so.

I call attention also to the important fact that periodontal lysis can only progress apically as fast as the alveolar crest recedes. This brings us back once more to the subject of alveolar resistance, a quality which is important both in progressive alveoloclasia and in rodent gingivitis.

It is apparent, then, that the periodontal membrane is not an original site of periodontal disease. This tissue, perhaps the most resistant of the periodontal structures, thus occupies an unhappy position between the Scylla of gingival disease and the Charybdis of bone deficiency.

A type of periodontal disease characterized by recession of the gingiva without apparent inflammation, which is often seen in the adult mouth, actually may fall in the class of progressive alveoloclasia in one case, being due largely to traumatic occlusion. In another case, it may be the result of local trauma from excessive and injudicious use of the toothbrush. In the first type, the gingiva recedes because deprived of the alveolar scaffolding which formerly held it up. In the second type of case, local trauma literally wears the gingiva away, recession of the alveolar crest being brought about by a circulatory change in the gingiva, whose objective is to protect the alveolar bone from exposure.

Other clinical types of periodontal disease can be fitted into the classification proposed, which has the virtue of simplicity as well as applicability.

SUMMARY

There are essentially two types of periodontal disease: progressive alveoloclasia and gingivitis. Gingivitis is subdivided into simple, in which the disease is limited to the marginal gingiva, and rodent, in which gingival inflammation eats its way into the cemental gingiva and, if combined with progressive alveoloclasia, causes pocket formation. Individual cases of periodontal disease are apt to exhibit a combination of progressive alveoloclasia and gingivitis. The possible range of proportions of the two types found in various cases is very great. Destruction of the periodontal membrane is secondary to alveolar resorption since the periodontal membrane is not a primary site of periodontal disease. Progressive alveoloclasia and gingivitis may be caused by either local or systemic conditions. By far the greater number of cases have both a local and a systemic etiology. The proportionate influence of local and systemic conditions varies widely from case to case.

I believe this classification will clarify much that has previously been obscure and confused in the pathology of periodontoclasia. Particularly, it should lead students in this field to give primary consideration to the factors, chiefly systemic, in progressive alveolar resorption.

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DENTAL PHARMACY

By EDWARD SPEASE,* Ph.C., B.Sc., Chicago, Ill.

THERE are perhaps few in the professions of dentistry and pharmacy, other than those who have come most recently from the colleges, who appreciate the fact that there is such a thing as dental pharmacy.

The pharmacist has not yet learned that he can be of service to the dentist and to his patients, nor has he realized to the fullest extent just what his duties are in this regard. Perhaps many dentists do not know just what service they should expect to receive from the practicing pharmacist. There may have been a good reason for this condition in times past, when the mechanical side of dentistry was stressed and the pharmacist may have been more of a technician than a scientist.

One evidence that dentists and pharmacists have not been familiar with one another's problems and that neither one has observed the growth and scientific progress in the other's profession is that even recently pharmacists have refused to fill dentists' prescriptions for such drugs as sulfanilamide, which may be dispensed only on prescription. Some pharmacists, apparently, do not know that the dentist may write prescriptions for any drug that a physician may prescribe, with no exceptions. The scientific development of dentistry makes it necessary for the dentist to use more drugs than formerly, and while he will never become a prolific prescriber, there are times when he finds it necessary to write prescriptions. It is hoped that the modern dentist will not follow the example of the many physicians who tell their patients to "just go and get" some drug and take it according to printed directions. This is not fair to the patient, without considering the question of fairness to the pharmacist, because it means that it was not prescribed, individually, for that patient. The patient, in turn, tells his neighbors that it is good for what ails them, because his dentist said so. Such a patient may never return to either physician or dentist for further advice.

Pharmacy schools are beginning to teach dental pharmacy, which is a knowledge of the drugs used by the dental profession; the standards for these drugs; how they may be prepared and compounded, and why the dentist uses them.

The dentist and pharmacist should be so well acquainted and so eager to cooperate with each other that the pharmacist will call on the dentist at regular intervals to inspect the dental medicine

*Director of professional relations, National Association of Retail Druggists.

cabinet and point out types of containers. He will indicate what drugs may deteriorate quickly and which should be purchased in small quantities and frequently and discuss new acceptable drugs. He will tell the dentist where available literature can be obtained about them or, better still, digests of that literature for the purpose of conserving the time of the dentist.

TABLE 1.—DANGEROUS DRUGS*

Aconite
Aminopyrine
Barbiturates
Benzedrine sulfate (for internal use)
Cantharides (for internal use)
Chrysarobin or goa powder
Chrysophanic acid
Cinchophen, neocinchophen and other cinchophen derivatives
Colchicine
Colchicum
Emetine
Phosphides
Phosphorus
Radium
Sulfanilamide
Sulfapyridine
Sulfathiazole and other sulfonamides
Tansy, tansy oil
Thiocyanates
Thyroid
The anthelmintic drugs:
Carbon tetrachloride
Tetrachlorethylene
Male fern (aspidium)
Santonin
Wormseed oil (chenopodium oil)
Thymol

*Drugs and preparations containing them listed as dangerous by the Pure Food and Drug Commissioner, April 24, 1941, and which must be restricted to sales only on prescription.

Both dentist and pharmacist should begin to recognize, as many physicians now do, what is meant by rational therapy, and both should become familiar with what modern dental and pharmaceutic education strives to teach about drugs.

The era of empiricism in the use of drugs is waning. We may reasonably hope that the day of *post hoc ergo propter hoc* (after this, therefore because of this) reasoning will soon be over and that it will be followed by an era of scientifically prepared remedies applied for scientific reasons.

As far as drugs and medicines are concerned, the practitioner should confine his use of them to those that are found in the recognized compendia—the bible of the professions of medicine, dentistry and pharmacy. A bible is a book of authoritative writings, and as the word may mean book or books, it may be applied to the four books that list official and approved drugs, medicines and pharmaceutic preparations.

The drug bible, with which all physicians, dentists and pharmacists should be familiar, consists of the United States Pharmacopoeia, the National Formulary, New and Nonofficial Remedies and Accepted Dental Remedies.

The United States Pharmacopoeia is a book containing an official list of drugs and chemicals and a few combinations of them, selected by a subcommittee of the revision committee, composed largely of physicians and dentists, known as the subcommittee on scope. It is the aim of this subcommittee to limit admissions to the list of substances which, in the light of present knowledge, have established and proved therapeutic merit.

The National Formulary consists largely of an official list of drugs and preparations which are in constant use by physicians and dentists without particular claims to therapeutic merit. It may list some preparations and drugs which have been deleted from the pharmacopeia.

New and Nonofficial Remedies consists of newly accepted dosage forms of official drugs, a list of proprietary medicines that may simply be brands of official drugs and certain other proprietary medicines which appear to have enough therapeutic evidence back of them to warrant admission and whose makers

have complied with the rulings of the Council on Pharmacy and Chemistry of the American Medical Association, which supervises claims for them.

the rulings of the Council on Dental Therapeutics of the American Dental Association. It contains "a list of official drugs selected to promote a rational den-

TABLE 2.—HABIT-FORMING DRUGS*

Parent Substance	Chemical Derivative
Barbituric acid...	Alurate
	Amytal
	Barbital
	Butisol
	Cyclopal, cyclopen
	Delvinal
	Dial
	Eldoral
	Eunarcon
	Evipal
	Ipral
	Mebaral
	Narconumal
	Neonal
	Nostal
	Ortal
	Pentenal
	Pentobarbital
	Pentothal
	Pernoston
	Phanodorn
	Phenobarbital
	Proponal
	Rutonal
	Sandoptal
	Sigmodal, rectidon
	All lithium, sodium, potassium, magnesium, calcium, strontium and ammonium salts of the foregoing chemical derivatives of barbituric acid.
	Seconal
	All salts of the foregoing chemical derivative formed by replacing the sodium with lithium, potassium, magnesium, calcium, strontium or ammonium radical.
Bromal.....	Bromal hydrate
	Bromotone
	Bromoform
Marihuana†.....	Extract of cannabis
	Fluidextract of cannabis
	Tincture of cannabis
Carbromal.....	Acetylcarbromal
	Bromural
	Neuronal
	Sedormid
Chloral.....	Alpha-chloralose
	Chloralformamide
	Chloral hydrate
	Chloralimide
	Chlorobutanol
Cocaine‡.....	All salts of cocaine obtained by combining cocaine with any acid.
Codeine‡.....	Dicodid
	Eucodal
	All salts of the foregoing chemical derivatives of codeine, and all salts of codeine, obtained by combining any such derivative or codeine with any acid.
	Eucodin
Heroin‡.....	All salts of heroin obtained by combining heroin with any acid.
Morphine‡.....	Dilaudid
	Ethylmorphine
	Paramorphan
	All salts of the foregoing chemical derivatives of morphine, and all salts of morphine, obtained by combining any such derivative or morphine with any acid.
Opium‡.....	Extract of opium
	Fluidextract of opium
	Tincture of opium
Paraldehyde.....	Metaldehyde
Sulphonmethane.	Sulfonethylmethane
	Sulfondiethylmethane

*List effective on April 20, 1942.
†Marihuana law applies, prescription may not be refilled.
‡Narcotic law applies, prescription may not be refilled.

Accepted Dental Remedies consists of a list of official and approved drugs and preparations which have complied with

tal materia medica and descriptions of acceptable nonofficial articles."

The United States Pharmacopoeia

and the National Formulary are both recognized as authorities upon the substances listed in them by the Federal Food, Drug and Cosmetic Act of 1938.

When one adds to the list of medicinals found in the U.S.P. and N.F. those proprietary medicines found in N.N.R., and those medicines which have been approved for admission to A.D.R., it would seem that there is little left, within the realm of rationality, that would be of value to the practicing dentist.

The pharmacist thinks of the substances found in the U.S.P. and N.F. as *official* drugs and medicines, and those, other than official ones, listed in N.N.R. and A.D.R. as *approved* drugs and medicines.

When a physician or a dentist permits himself to prescribe or use drugs or pharmaceutic preparations, or recommends proprietaries, other than those found in the professional bible, he not only evinces a skepticism regarding the ability of the leaders of his profession, but also exhibits a very low sales resistance. Both the American Medical Association and the American Dental Association maintain scientific laboratories and well-trained professional staffs for the purpose of investigating new drugs and combinations, and it is doubtful whether that long sought for and often heralded panacea for all ills will be discovered without one or the other of these laboratories finding out about it.

The long list of proprietaries and nostrums which have appeared in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION as not acceptable for inclusion in Accepted Dental Remedies stands as a testimonial that the dental laboratory knows its functions and performs them with the greatest integrity, being mindful first of the best interests of the patient and secondly of the welfare of the dental profession.

It may be of interest to the dental profession to know what the modern pharmacist is being taught as to his duties to the medical and dental professions and what should be his aim in reference to the services that he should be ready to render to them.

The pharmacist should be familiar with the drugs used by the dentist and, in a general way, with the uses to which these drugs are to be put. Only close association with the dentist can keep him up-to-date in regard to uses and new combinations upon which the dentist may wish information. The duties of the pharmacist are not alone those of dispensing: he must be able to offer suggestions on vehicles, colors and flavors and upon forms that can be most easily administered. He should be equipped to find any information which a busy dentist may wish to have about any drug or chemical or combinations of them. He should have information upon approved proprietaries and be willing to get such information as exists upon those not approved. He is able to help the dentist formulate prescriptions to provide a drug in the most suitable form for administration. He has the literature at his command to give the dentist information upon standards, tests, strengths, keeping qualities and like information. In other words, the dentist should regard the pharmacist as his professional associate, and conferences between them should be frequent.

There has been much discussion over the years about prescriptions, as to whether they should be written in English or Latin and whether weights and measures should be in the apothecaries' or the metric system. It matters not whether Latin or English is used, nor does it matter which system of weights and measures is employed, other than that it is not good form to use a mixture of Latin and English and a mixture of the apothecaries' and the metric system in the same prescription.

Modern professional and scientific schools now teach the metric system of

weights and measures, and it is proper to say that the use of the metric system in prescription writing is recommended by the best thought upon the subject. The dentists should know the three factors used to convert all weights and measures from one system to that of another: 1 meter=39.37 inches; 1 gram=15.432 grains; 29.57 cc.=1 fluidounce.

Prescriptions are seldom, if ever, written in Latin, though the most meticulous of writers do use the Latin titles for the drugs, and still use some Latin abbreviations in directions to the pharmacist and for the sake of brevity in writing the directions which are to be transcribed upon the label. It may be said that the use of Latin to the extent just mentioned should be given due weight by the dentist as far as that use impresses the patient, and even the pharmacist, with the erudition of the dentist. It is logical to assume that one who knows the scientific language of his profession may know considerable about his profession too. The main reason why many physicians, dentists and pharmacists are not interested in a careful prescription technic is lack of practice in prescription writing. The time for a dentist to learn it is after he is in practice. No amount of classroom or practice clinic teaching can give more than the fundamentals. It takes practice in this as in other matters to become perfect.

Every dentist is familiar with the fact that there is a narcotic law and that certain drugs known as narcotics may be dispensed only upon prescription and that the prescription must be written as specified by law. He may not be quite so familiar with the list of drugs known as dangerous drugs and the list known as habit forming drugs. The Food, Drug and Cosmetic Act of June 1938 placed restrictions upon such drugs and they now may be dispensed only upon prescription. The department of government which enforces this act has gone farther, perhaps upon the request of pharmacists, and made an attempt to compile a list of such drugs. These prescriptions, unlike the prescriptions for narcotic drugs, may be refilled by the pharmacist, but only after the consent of the prescriber. This consent may be given by telephone, but this fact must be noted upon the prescription. In Table 1 is a list of drugs of dental interest which are called dangerous drugs. In Table 2 is a list of drugs which are known as habit forming. Both lists are to be found in federal regulations.

It appears that both physicians and dentists would appreciate the value of this act to public health, would recognize the confidence placed in them by the act and would rise to the occasion and assume their responsibility in the matter. Neither physicians nor dentists should send patients to the drug store to ask for these drugs, which the pharmacist may not sell without a prescription.

As was stated in the beginning of this article, many pharmacists do not know or, perhaps better, have not yet realized just what their responsibility is regarding cooperation with and service to the dentist. A little effort upon the part of the dentist will meet with a response from the pharmacist that the dentist will find indeed gratifying. The good-will of the pharmacist is an asset to any practicing dentist. The pharmacist, in addition to what has already been mentioned, can manufacture and prepare practically every solution, preparation and medicament that a dentist uses; and can furnish them to the dentist at a much lower cost than the dentist can procure them for if he pays the cost of proprietary titles and advertising which is added to the cost of the ingredients. It is to the best interest of patient, dentist and pharmacist for the dentist and pharmacist to become closely associated in professional matters.

205 West Wacker Drive.

THE JOURNAL *of the*
AMERICAN DENTAL ASSOCIATION

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Published by the American Dental Association
212 East Superior St., Chicago, Ill.

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association.

Communications intended for publication in the scientific or literary pages of THE JOURNAL should be addressed to the Editor. All advertising or business matter should be sent to the Business Manager.

Subscription is included in the annual membership dues. The subscription rate to non-members is $5.00 a year in advance, this rate applying to both domestic and foreign subscriptions. All foreign subscriptions are to be paid in United States money.

A NOTEWORTHY BENEFACTION

IT is a matter for congratulation when a great philanthropic agency recognizes the importance of dentistry to the health of the community and materializes its interest therein by providing the means whereby dental service to the public can be intelligently and efficiently rendered through the agency of higher education.

Some years ago, in 1938, the dental profession of Michigan and the Dental School of the University of Michigan were fortunate enough to receive such recognition from the W. K. Kellogg Foundation of Battle Creek, Mich., which materialized its appreciation of dental service to the public by an appropriation of nearly half a million dollars to be used for erecting a building to be known as the W. K. Kellogg Foundation Institute for Graduate and Postgraduate Dental Education.

This appropriation marked an epochal event in the development of dental education and its influence toward that development has been such as to place the Dental School of Michigan in the vanguard of university dental schools in advancing the standards of dental education.

Compared to medicine, dentistry has failed by far to receive its merited share of health agency benefactions, and this lack of endowment has been a serious handicap in its endeavor to contribute all that it should and could toward the development of the biologic aspect of dentistry.

During the past two decades, several hundred millions of dollars have been donated to the cause of medical education, but dentistry has not shared to anything like a proportionate extent in these large endowments for human welfare, even though dental health service has been recognized as an important factor in the health of the nation. On the contrary, dentistry has been criticized for dereliction in the field of scientific research by some of those connected with the large welfare foundations, a criticism that we believe is unjust in that it implies that the entire burden for scientific dental research and development should be borne by the dental profession.

The intimate relationship of the tissues and the organs of the oral cavity to the body has, in recent years, become more clearly defined, and this definition has developed a field for therapeutic endeavor that has not previously been satisfactorily occupied by either profession. Certain specialists of medicine and dentistry have become equipped by individual effort to deal intelligently with the diseases in this borderline field, but only comparatively recently has any concerted effort been organized whereby a considerable number or any particular class of practitioners have been trained to deal with these problems.

It is, we believe, slowly but surely being realized that intelligent handling of the problems involved in this field can be arrived at only through sympathetic cooperation of the two professions in educating men to a sound knowledge of the etiology, pathology and therapeutics of those diseases consideration of which involves a certain amount of education in both medicine and dentistry. This, we feel sure, can be accomplished only by closer educational cooperation between the two professions, and not by either singly, mainly for the reason that the curricula of both are now crowded to the utmost.

The broadening of the educational scope of dentistry as is proposed under the graduate and postgraduate activities of the new Kellogg Institute is one of the means by which dentistry will form an association with the other biologic sciences enabling it to do its share in caring for diseases involving the oral cavity and the general system.

It seems inevitable that the centralizing of education under university organization shall be the plan upon which future education of all kinds

must be conducted, and there is no doubt that closer cooperation between medicine and dentistry in the field of professional education will be beneficial to both professions, in that it will offer a solution to problems that neither is at present ill-prepared to handle alone. This need, we hope, will be supplied in this new approach to dental education by the Michigan institution.

Mr. Kellogg, in establishing the foundation, gave serious thought to the character of health welfare philanthropy that would be of the most good to the greatest number. His experience in the nutritional field convinced him that any plan for health benefits to the community would have to elvolve through education of and benefit to the younger generation, in that the adult was adamant to any change that would disturb a long range habit development. Mr. Kellogg therefore resolved to provide for an attack upon the general health problem through health care for children, the most hopeful approach being through the care of the mouth and teeth.

The Foundation magnanimously provides for postgraduate work by dentists that will enable them to learn and apply the latest and most effective means of providing dental health to the community. That the efforts in this direction have been conspicuously successful is indicated by the interest manifested in the postgraduate work at the University of Michigan and the continued return year after year of large numbers of dentists seeking knowledge regarding the latest developments in dental health service.

In 1941, the Foundation made an additional grant of $110,000 to the University of Michigan School of Dentistry to provide funds for the rehabilitation of the undergraduate technical laboratories and to provide complete instrument kits for the use of all undergraduate students during the course of instruction.

The intense interest in the educational aspect of dentistry manifested by the Kellogg Foundation has just recently expressed itself in what we believe to be a generous and magnanimous attitude toward the student who is attempting to equip himself for dental service. The Foundation has recognized the burden which the accelerated course would impose upon a large number of students seeking the dental degree in that it would deprive many of them of the opportunity to earn money for the pursuit of their education through employment in the summer period.

The Foundation has, therefore, offered to nearly all dental schools a fund of ten thousand dollars to provide scholarships or loans for deserv-

ing students at the discretion of the school administration. Originally, it was proposed to limit this fund to schools that entered upon the accelerated program, but the grant has been extended to schools that did not adopt the accelerated program.

This generosity of the Foundation, an outstanding benefaction to dentistry, elicits the gratitude of the profession not only of Michigan, but also throughout the country, and, we trust, will prompt similar gifts for dental education and dental scientific research from other sources.

Among the direct benefits of the latest benefaction that we hope to see is the opportunity to refute for all time the long existing fetish that, to efficiently educate its practitioners, dentistry must go to medicine for a knowledge of the biologic problems with which, in a professional way, it is called upon to deal.

BIBLIOGRAPHICAL

Handbook of Scientific and Technical Societies and Institutions of the United States and Canada

Fourth Edition. N. R. C. Bulletin No. 106, January 1942: 389 pages. Price $4.00. Cloth.

THE National Research Council has recently issued the fourth edition of a Handbook of Scientific and Technical Societies and Institutions of the United States and Canada. The United States section contains information on 1,269 societies, associations and similar organizations in the natural sciences and related fields that contribute to the advancement of knowledge through their meetings, publications and other resources. There are also included a number of more general organizations and special institutions supporting scientific research, as well as the constituent or affiliated societies of the three other national research councils of the United States: the American Council of Learned Societies, the American Council on Education and the Social Science Research Council. The Canadian section, compiled through the cooperation of the National Research Council of Canada, contains information concerning 143 organizations.

The handbook gives, in most cases, the names of the president and the secretary of the organization; the history, object, membership, meetings, research funds and serial publications. A subject index to each section (United States and Canadian) includes a classification of the activities, funds, periodicals and change of name as reported in the history. The fourth edition has a personnel index also for each section.

The information for the fourth edition was furnished during the period July 1, 1941-January 15, 1942, by the organizations.

For sale by the National Research Council, 2101 Constitution Avenue, Washington, D. C.

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President's Message

MAJOR PROBLEMS CONFRONTING DENTISTRY TODAY

AMERICA is faced with three major problems. We must win the war as quickly as possible. We must win the peace in a way that will keep the Axis savages from again raising their ugly heads. We must do both of these things and at the same time guard the philosophy of government to which we have subscribed, and under which we have lived for more than a century and a half. We face no small task in our attempt to accomplish these purposes. The demands upon all of us in every walk of life will doubtless be severe, presenting challenges which will test our individual and collective resources to their utmost limits. Yet to win the war, to win the peace and to preserve the American principles of government will be worth any sacrifice that we may be able to make.

Involved in the achievement of these three major purposes is the dental profession, now beginning its second century as an organized profession. In its first century, dentistry passed through three major wars, none of which were what we now call total war. Nevertheless, they were important, placing a great strain upon our population and upon the profession. Until the end of the First World War, the problems of peace were not significant. And even then we felt that the transition from war to peace and to normal times would be more or less automatic and that we would adjust ourselves as we had done after previous wars. But we did not take into account the revolutionary forces released by war, or the ferments let loose by research. We did not anticipate the social and economic problems, which we soon came to know so well. Little did we realize that the first World War would bring such changes in lives and in our methods of living. No field remained untouched, and no field has yet completely recovered from the impact of that major war.

I mention America's three major problems and the effects of the first World War not for the purpose of merely pointing to well-known facts, but rather because I am concerned with the great emphasis which organized dentistry should give to its position, and the part which it is to play in the solution of these problems. I am also concerned with the effect which the war and the problems of peace may have upon the dental profession as an agency for public good and upon the dental practitioner as an individual. Again, with the thought that we are in a war which must be won, what will the

world order as affecting dentistry be from now on? That question, which has come to the front in the last several months, is apt to be asked very frequently in the future.

While I believe that the world order will, for a time, be somewhat different from what it has been in the past, in this order I feel that the dental profession will be challenged to accept certain responsibilities, not in terms of regimentation, but in terms of the knowledge available for better dental health. As the government has called upon the dental profession during the period of defense and war, so also is it apt to call upon dentistry in the postwar period. What the end-result will be, we do not know. However, one thing we do know, and that is that dentistry must have a forward-looking plan to offer society in the future—a plan based upon an intelligent and broad concept of the problem of dental caries and all of the conditions which bring it into existence.

Here I am pleased to point out that the Board of Trustees of the American Dental Association, at its February meeting, approved a plan of caries control recommended by the National Health Committee. This plan assumes that dental caries is controllable and that, in the long run, the control can be reasonably effective if the nutritionist, the pediatrician, the food distributor and those in other fields do their part and cease to imply that the dentist, and only the dentist, is responsible for the widespread evidence of dental defects in the population. As the plan for caries control suggests, society should see that children have adequate nutrition and health education and that the milk distributor, the corner grocer and the fruit dealer are not without their responsibilities in this important problem.

Dentistry must see to it that the various special fields which touch upon the caries problem are mobilized as they are in cancer control or in tuberculosis control. In these two instances, society has accepted challenges in preventive or control measures and has fostered broad and significant educational efforts, with good results. Here may I point out that, in these days of widespread specialization, we must go in for teamwork and, in this case, with the team under the direction of the dental profession, we can accomplish much more good than has come from various European plans, which have been based largely on the assumption that the dental profession alone is the only group out of step. While we will hear more of this plan of caries control in the near future, I bring it up here as an example of what we should offer and what we should urge society, for its own good, to accept. Whatever we may think about one plan or another, we must have a plan; for no profession can exist in this changing world in isolation, as was possible in the early days of dentistry in this country.

Another aspect of our problem now and in the future has to do

with inter-American professional relations. As the distance across the Atlantic and the Pacific is being shortened by modern transportation, so also is the distance between this and the Central and South American countries being reduced to a point where our neighbors are coming closer and closer each year. Now the stronghold of democracy is in this hemisphere, and I can assure you that the much-used terms "hemispheric solidarity" and "the good neighbor policy" are something more than catch phrases. But what I wish to point out is the fact that as a profession, well organized and with excellent resources, we should hold as one of our aims that of providing effective cooperation with our government in this matter of promoting inter-American relations from a professional point of view. We should consider that these inter-American relations are two sided and that there must be an exchange of professional thought and action if these relations are to be profitable in terms of the advancement of dental health service. It is not going too far to suggest that much benefit can be derived from study of Central and South American countries. Such study, neglected by too many for too long a period, will provide the basis for better understanding of related public and professional problems and pave the way for a time when transportation between the United States and countries to the south will be simplified by advances in air travel facilities. There is much for us to do in this problem, and we should do all we can in every way possible as citizens and as practitioners.

Space will not permit me to discuss many of our direct and indirect problems. What I hope is that the dental profession, which through its own efforts has made great advances for a profession so young as an organization, will see this changing world as it really is, and as it is very likely to be, that the profession will be forward-looking when foresight is more necessary than ever before. In war or in peace, change causes impacts upon our customs and traditions. But we must be able to adjust ourselves. There must be movement and flexibility not only because of war, but also because of the probable pressures of the postwar period. When we add to the revolutionary forces released by war those which are the product of research in all fields, we can only conclude that dentistry is for some time going to exist in a rapidly changing world—a world which will need pioneers equipped with ideas, ideas which lend themselves to the solution of current and future problems.

Orren a. Oliver

DENTAL PREPAREDNESS COMMITTEE

JOINT STATEMENT: OFFICE OF CIVILIAN DEFENSE AND AMERICAN RED CROSS

To secure unity of effort and avoid duplication of facilities in meeting civilian needs arising from enemy action, this statement is issued by the Office of Civilian Defense and the American National Red Cross for the guidance of Defense Councils and Red Cross chapters.

It is the responsibility of local defense councils to see that adequate provision is made for all services required in the event of bombing or other enemy attack. During an emergency period, the commander of the citizens' defense corps will exercise control over all such services.

With respect to emergency medical services and emergency feeding, housing and clothing, provision should be made in each community in conformity with the following principles:

EMERGENCY MEDICAL SERVICES

During bombing or other enemy attack, all services are directed from the control center in charge of the commander of the citizens' defense corps. Responsibility for the care of those injured as a result of enemy action rests with the emergency medical service of the citizens' defense corps under the direction of the chief of the emergency medical service.

Red Cross chapters assist the emergency medical service by (a) recruiting and training volunteer nurses' aides, who will be utilized by the emergency medical service at base and casualty hospitals, casualty stations and first aid posts; (b) furnishing lists of persons trained in first aid to be enlisted by the emergency medical service as members of its stretcher teams; (c) providing dressings, bandages and supplementary equipment as the chapter may decide in consultation with the chief of emergency medical service; (d) equipping and operating emergency ambulances to be assigned to the emergency medical service and to serve under its direction; (e) providing supplementary transportation for walking injured and for emergency medical service personnel. During the emergency period, ambulances and motor units assigned to such transportation service will be under the direction of the chief of emergency medical service or the transport officer. The emergency medical service of the office of civilian defense will not be duplicated by the Red Cross, but will be utilized by the Red Cross in natural disasters.

EMERGENCY FEEDING, HOUSING AND CLOTHING

In the joint statement dated April 17, 1942, of the Office of Defense Health and Welfare Services and the American Red Cross, it is agreed that "with respect to the emergency period during which special facilities must be made available to meet emergency needs without notice, the Federal Security Administrator will look to the organizations, facilities and resources of the American Red Cross to provide food, clothing and temporary shelter." These services will be provided locally during an emergency period by the Red Cross under the control of the commander of the citizens' defense corps in accordance with detailed plans to be worked out jointly by the commander, the Red Cross Chapter and the public welfare authority.

Defense councils should avoid duplication of these facilities. Where an emergency food and housing corps has already

been organized and equipped to the satisfaction of the commander of the citizens' defense corps, its function should be coordinated with those of the public welfare authorities and the Red Cross Chapter and if possible consolidated.

After the emergency period, the appropriate public agencies are expected to undertake the care of civilians in accordance with plans developed in conjunction with the Office of Defense Health and Welfare Services and the Federal Security Administrator. Funds will be made available for this purpose by the Federal Government through the Federal Security Administrator. Local welfare agencies and Red Cross chapters should be guided in their relationships by the agreement signed on April 17, 1942, by the Office of Defense Health and Welfare Service and the American Red Cross.

All Red Cross volunteers enlisted in the emergency feeding and housing service, and all other Red Cross volunteers who are to be in service during and following bombing or other enemy action, will register with the local civilian defense volunteer office. The cards of all such registrants are to be marked so as to show that these volunteers are in Red Cross service. In order to obtain necessary freedom of movement during and immediately after enemy action, Red Cross personnel certified to the commander by the chapter for emergency feeding, housing and clothing services will be furnished with identification cards issued to the citizens' defense corps personnel, and will be authorized to wear the official armband.

This statement supersedes the joint statements of September 4 and December 22, 1941.

Approved: May 18, 1942.

NORMAN H. DAVIS, *Chairman*
American Red Cross.

JAMES M. LANDIS, *Director*
Office of Civilian Defense.

PROCUREMENT AND ASSIGNMENT SERVICE

REQUISITIONS recently made on the Procurement and Assignment Service for dentists now call for several thousand to enter the armed forces before December 1942. Those interested in seeking commissions in the Dental Corps Reserve, United States Navy, should contact the Director of the Office of Naval Officer Procurement, in their nearest naval district. The Navy now needs many dentists 35 years of age and under.

Those desiring a commission in the Dental Corps, Army of the United States, should communicate at once with their respective state chairmen for dentists, representing the Procurement and Assignment Service. The names of all who apply will be cleared from the standpoint of availability by the state chairmen and their names will be made known to the medical officer recruiting boards, which are now functioning in every state of the Union, and the District of Columbia. Qualified dentists who are 37 years of age and under, or those older who have been placed in Class 1-A, should make immediate application with a view to a commission. The following release is from the office of the Surgeon General, Dental Service, for the information of those desiring commission in the Army:

1. At the present time appointments in the Dental Corps, Army of the United States, are available to qualified dentists who are not over 37 years of age, and all those who have been placed in Class 1-A by their local induction boards.

2. To be eligible for commission, an applicant must be an American citizen, a graduate of a recognized dental school and

physically qualified for service as shown by a final type physical examination. Candidates must possess a license to practice dentistry in a state, territory or the District of Columbia, and be actually engaged in the practice of their profession. Possession of a license may be waived for a period of one year subsequent to graduation provided that year has been spent in postgraduate work.

3. Candidates qualified for limited duty only will not be appointed. However, if inducted by their local Selective Service boards, upon induction, they may reapply for commission and, if found otherwise qualified, they will be discharged from their enlisted status and commissioned in the Dental Corps, Army of the United States.

R. C. CRAVEN,
Colonel, Dental Corps,
Assistant.

The Medical Officer Recruiting Boards of the Army have the authority to initiate application forms, to authorize physical examinations, to make the final decisions regarding the professional and physical qualifications of candidates and to tender commissions to those found qualified at once.

Any dentist who believes himself qualified for a commission and who has applied more than thirty days ago and whose application has not been acted upon should contact his state chairman for dentists and ask that the recruiting board consider his application.

The offices of Naval Officer Procurement are listed below:

1st Naval District, 150 Causeway St., Boston, Mass.

3rd Naval District, 33 Pine St., New York, N. Y.

4th Naval District, 17th Floor, Widener Bldg., Philadelphia, Pa.

5th Naval District, Chevrolet Parts Bldg., Norfolk and Altamont Sts., Richmond, Va.

6th Naval District, The Center, Marion Square, Charleston, S. C.

7th Naval District, Langford Bldg., 121 S.E. First St., Miami, Fla.

8th Naval District, Louisiana Bldg., 217-227 Camp St., New Orleans, La.

9th Naval District, Board of Trade Bldg., 141 W. Jackson Blvd., Chicago, Ill.

11th Naval District, 850 Lilac Terrace, Los Angeles, Calif.

12th Naval District, Federal Office Bldg., Civic Center, San Francisco, Calif.

13th Naval District, 117 Marion St., Seattle, Wash.

Washington, D. C., 1320 G St., N. W.

Following is a list of the state chairmen for dentists of the Procurement and Assignment Service:

FIRST CORPS AREA

Conn. Louis R. Siegal, 750 Main St., Hartford

Maine. Giles C. Grant, 655 Congress St., Portland

Mass. Andrew J. Rafferty, 390 Main St., Worcester

N. H. William H. Putney, 85 Pleasant St., Concord

R. I. E. C. Elliott, 615 Union Trust Bldg., Providence

Vt. Maxwell L. Jameson, 69 Pine St., Burlington

SECOND CORPS AREA

Del. William Stewart, Jr., Medical Arts Building, Wilmington

N. J. E. C. Stillwell, 815 Bloomfield Ave., Glen Ridge

N. Y. William McG. Burns, 80 Hanson Place, Brooklyn

THIRD CORPS AREA

Md. T. J. Bland, Medical Arts Building, Baltimore

Pa. R. H. Nones, 1930 Chestnut St., Philadelphia

Va. J. H. John, Medical Arts Building, Roanoke

D. C. George Albert Smith, 1835 Eye St., N. W., Washington

FOURTH CORPS AREA

Ala. C. B. Bray, American Cast Iron Co., Birmingham

Fla. E. C. Lunsford, 2742 Biscayne Blvd., Miami

Ga. R. H. Murphy, 920 Persons Bldg., Macon

La. Larry J. Dupuy, 837 Maison Blanche Bldg., New Orleans

Miss. George P. Evans, Standard Life Building, Jackson

N. C. H. O. Lineberger, 804 Professional Bldg., Raleigh
S. C. E. W. Shepard, Andrews Building, Spartanburg
Tenn. Lawrence T. Kennedy, Medical Arts Building, Knoxville

FIFTH CORPS AREA

Ind. H. T. Berkey, Wayne Pharmacal Building, Fort Wayne
Ky. E. C. Hume, 746 Francis Bldg., Louisville
Ohio. Frank C. Starr, 150 E. Broad St., Columbus
W. Va. I. J. Kail, 1017 First Nat'l Bank Bldg., Huntington

SIXTH CORPS AREA

Ill. William I. McNeil, 59 E. Madison St., Chicago
Mich. J. O. Goodsell, Second Nat'l Bank Building, Saginaw
(Send copies of all publicity and correspondence to: Mr. H. C. Gerber, Jr., Michigan State Dental Society, Olds Tower Building, Lansing)
Wis. Charles Baumann, 408 West Greenfield Ave., Milwaukee

SEVENTH CORPS AREA

Ark. I. M. Sternberg, Merchants Bank Building, Fort Smith
Iowa. John Voss, Voss Building, Iowa City
Kan. John W. Richmond, Huron Building, Kansas City
Minn. J. P. Werrick, Medical Arts Building, Minneapolis
Mo. R. J. Rinehart, Kansas City-Western Dental College, Kansas City
Nebr. Lawrence A. Donahoe, 1128 City National Bank Bldg., Omaha
N. D. A. O. Schjeldahl, 523½ 5th Ave., Valley City
S. D. R. W. Ellis, Salem
Wyo. L. C. Hunt, 308 W. 3rd Ave., Cheyenne

EIGHTH CORPS AREA

Ariz. W. A. Baker, Professional Building, Phoenix
Colo. E. M. Silverberg, 809 Republic Building, Denver
N. M. M. R. Chapin, 31 Moro Building, Gallup
Okla. A C. Seids, 1200 N. Walker St., Oklahoma City
Texas. J. E. Robinson, Medical Arts Building, San Antonio

NINTH CORPS AREA

Calif. Southern. Kenneth J. Ruedy, 3780 Wilshire Blvd., Los Angeles
Calif. Northern. J. W. Leggett, 490 Post St., San Francisco
Idaho. J. E. Bennett, Idaho Falls
Mont. D. H. McCauley, 9 First Ave., Laurel
Nev. G. C. Steinmiller, Masonic Temple, Reno
Ore. N. L. Zimmerman, Medical Dental Building, Portland
Utah. C. O. Robinson, Medical Arts Building, Salt Lake City
Wash. L. L. Foote, Medical and Dental Building, Seattle

I would emphasize that the number of dentists needed by the armed forces will not be so great as the number of physicians required, and that all who intend to participate in the military program should seek commission. There is no experience in civil life which qualifies an individual for military duties. For this reason, those who enter the service at an early date will find that the experience gained in the coming months will fit them for greater responsibilities and rank as the armed forces expand.

SAM F. SEELEY, M.D.,
Executive Officer
Procurement and
Assignment Service.

BUREAU OF PUBLIC RELATIONS

THE CHILD, THE SCHOOL AND DENTAL TREATMENT

By FRANK W. NASH, D.D.S., Scranton, Pa.

A GREAT deal has been said in the past few years in favor of dentistry for children; but despite all that has been said, it appears that we are still a great distance from our goal. Undoubtedly, there are many reasons for this. There are barriers of misunderstanding still to be broken down. There are standards of appreciation yet to be realized—appreciation by the laity of what dental health is and what dental service is—appreciation within the profession by a far greater number of the aim of dentistry. Millard D. Gibbs[1] quotes the *Journal of the Illinois Dental Society* in describing dentistry as it should be: "The ultimate accomplishment of the dental profession should be the establishment of dental service as a health service and the dentist as a counsellor of advice rather than the purveyor of devices."

It is the purpose here to discuss one important factor in promoting dental service for children. That factor is the time of day and week at which the service is rendered. Children cannot be cared for properly after school or on Saturday. From conversation with many men and personal observation in the practice of orthodontics, it is believed that the great majority of dentists give such attention as they can to serving children in the hours after school and on Saturdays. More than one dentist has told me that he can manage the child case satisfactorily in this way. These men are wrong: it is a physical impossibility for dentists to render satisfactory service to children after school and on Saturdays. Among other things, the child is tired and not inclined to be cooperative. The illustrations show some conditions which may result from attempting to crowd children in after school and on Saturdays.

All illustrated cases, a result of inadequate dental service, showed malocclusion. From studies by Brandhorst,[2] for example, 37 per cent of malocclusion cases resulted from premature loss of teeth. My observations on children of the lower economic brackets (Boys' Club clinic) are that the considerably higher incidence of malocclusion in these children is due to lack of care of the developing denture.

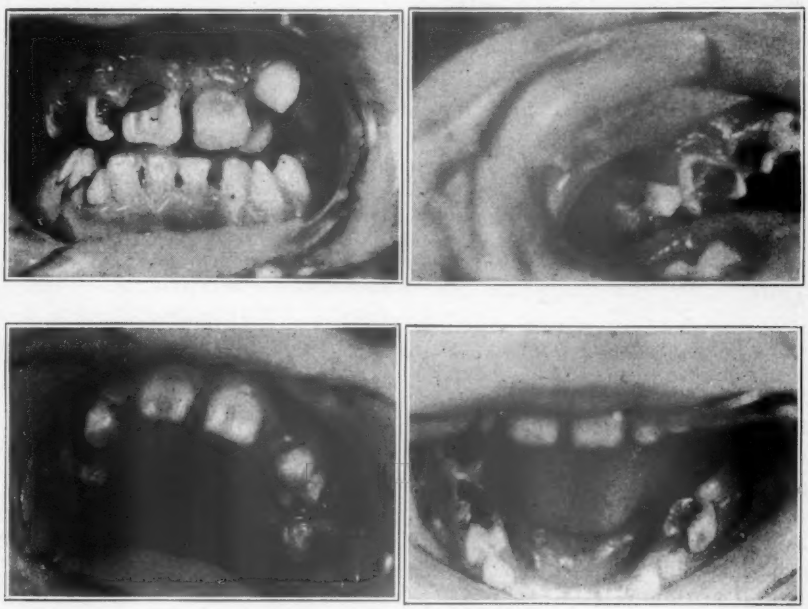
I have had to explain fully my reason for insisting on appointments during the school morning. The reaction of five out of ten parents to this requirement is reluctant acquiescence. Four and one-half out of ten are willing and happy to cooperate in meeting this requirement. About one-half out of ten give up the idea of treatment or seek someone who will attempt treatment entirely outside school hours. The foregoing averages hold good in my practice for the children of physicians and dentists.

I am in a limited field of practice. Cases are referred to me with that in mind. Thus, if it is difficult and continually necessary to discuss the matter of time with that class of patients who

Read before the Section on Orthodontia at the Eighty-Fourth Annual Meeting of the American Dental Association, Houston, Texas, October 30, 1941.

may be said to be dentally conscious, it must follow that it is considerably more difficult to convince the dentally unconscious. It seems to me that the continual effort of dentists to "oblige" people and make themselves appear considerate by giving after school appointments is one of the things that have put dentistry in a position which lacks dignity. Giving people reason to feel that satisfactory service can be rendered by such appointments is in truth a disservice to the profession. One of the things that will do much to awaken parents and educators to appreciation and respect for dental service for children is the demand by the dentist for proper time to do it.

While not conversant with every clinic for children throughout the country, I understand that the successful ones receive children during school hours for treatment. No objection whatever is made to this procedure. In school districts employing dentists, the children are taken during the school day for treatment. Many of these school staffs see patients for examinations and extraction of badly decayed teeth. Only a small amount of restorative treatment is carried out. Personal observation indicated that even the salvage type of service is incomplete because of the number of children and the small number of dentists. If the foregoing is true, how are the general private practitioners to fulfil their obligations unless they likewise receive children during school hours?



Malocclusion from inadequate dental service.

Figures for the 1940 census are not yet available. Figures taken from the Census of 1930 are shown in the accompanying table.

Leven and Beck[3] state regarding the number of different patients in 1929,

> The estimates made by dentists of the number of different patients they treated during 1929 vary greatly. . . . The medians

of the number of patients are: all practitioners 429; general practitioners 437.

With a figure of 63,000 dentists for purposes of calculation, 27,531,000 persons could be cared for on the basis of Leven and Beck's figures. This is less than the number of children in the age groups of 3 to 14 years.

CENSUS OF 1930

AGE YEARS	NO. OF PERSONS	TOTAL
3	2,394,463	4,765,018
4	2,368,555	
5	2,505,250	
6	2,515,285	
7	2,470,159	12,607,609
8	2,604,215	
9	2,512,700	
10	2,500,648	
11	2,319,394	12,004,877
12	2,480,123	
13	2,322,327	29,375,504
14	2,382,385	
15	2,295,699	
16	2,367,315	11,552,115
17	2,295,822	
18	2,357,834	40,927,619
19	2,235,445	

Leven and Beck[4] report, in their Table 29, that the average normal week of all practitioners is thirty-two hours at the chair. If eighteen hours per week were devoted to children by all practitioners about 51 per cent of the 27,531,000 persons could be children. This again means that only a fraction of those between 5 and 14 years of age could be cared for.

It seems obvious that when such a situation exists, there must be something wrong. While doubtless the causes are many, it is believed that a bolder, but dignified, statement to parents, teachers and school officials by the dentist, of his position, of his need for time to care for children adequately will lead to cooperation from these people. Many people, including physicians, as a result of the draft, are learning something about the results of dental neglect. To quote from a bulletin of the National Dental Hygiene Association,[5] "The dental health problem begins with the teeth of children."

CONCLUSIONS

1. After-school hours and Saturdays do not give sufficient or proper time for dental care for children.

2. Dentists should take it upon themselves to secure sufficient time for such service.

3. It is hoped that parents and educators, as well as dentists, will discuss this phase of dental health in a spirit of cooperation and with a view to elimination of the problem involved.

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2. BRANDHORST, O. W.: Promoting Normal Development by Maintaining Function of Deciduous Teeth. J.A.D.A., 19:1196-1205, July 1932.

3. LEVEN, MAURICE, and BECK, DOROTHY F.: Practice of Dentistry and Incomes of Dentists in Twenty States; 1929. University of Chicago Press, 1932, p. 55.

4. *Ibid.*, p. 51.

5. Army's Toothache—An Old Story. National Dental Hygiene Association.

Medical Arts Building.

COUNCIL ON DENTAL THERAPEUTICS

REPORT OF THE THIRTEENTH ANNUAL MEETING OF THE COUNCIL ON DENTAL THERAPEUTICS

THE Thirteenth Annual Meeting of the Council on Dental Therapeutics was held at the Shoreland Hotel, Chicago, Ill., Friday and Saturday, April 24 and 25, 1942.

The following members of the Council were in attendance:

J. Howard Brown, Ph.D., ScD., Johns Hopkins University, Baltimore, Md.

Paul J. Hanzlik, M.D., Vice Chairman of the Council, Stanford University School of Medicine, San Francisco, Calif.

Thomas J. Hill, D.D.S., Western Reserve University School of Dentistry, Cleveland, Ohio.

Paul H. Jeserich, A.B., D.D.S., University of Michigan School of Dentistry, Ann Arbor, Mich.

Harry Lyons, D.D.S., Medical College of Virginia, School of Dentistry, Richmond, Va.

Arno B. Luckhardt, M.D., Ph.D., Sc.D., LL.D., University of Chicago, Chicago, Ill.

Victor C. Myers, Ph.D., Sc.D., Western Reserve University, Schools of Dentistry and Medicine, Cleveland, Ohio.

Harold S. Smith, D.D.S., Chairman of the Council, Chicago, Ill.

Harold L. Hansen, Ph.D., Secretary of the Council; Director, A.D.A. Bureau of Chemistry, Chicago, Ill.

The following were present at all or part of the sessions on invitation:

L. Pierce Anthony, Editor, JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, Chicago, Ill.

Franklin C. Bing, Secretary, Council on Foods and Nutrition, American Medical Association, Chicago, Ill.

Howard A. Carter, Secretary, Council on Physical Therapy, American Medical Association, Chicago, Ill.

R. P. Herwick, Chief, Drug Division, Food and Drug Administration, Washington, D. C.

Harlan H. Horner, Secretary, Council on Dental Education, American Dental Association, Chicago, Ill.

Howard C. Miller, Trustee of the American Dental Association, Chicago, Ill.

Lon W. Morrey, Director, Bureau of Public Relations, American Dental Association, Chicago, Ill.

Harry B. Pinney, General Secretary, American Dental Association, Chicago, Ill.

Austin E. Smith, Acting Secretary, Council on Pharmacy and Chemistry, American Medical Association, Chicago, Ill.

Gerald D. Timmons, Executive Secretary, American Dental Association, Chicago, Ill.

Donald A. Wallace, Associate Chemist, A.D.A. Bureau of Chemistry, Chicago, Ill.

H. B. Washburn, Trustee of the American Dental Association and Chairman of the Contact Committee to the Council from the Board of Trustees, St. Paul, Minn.

The events of the past year which have profoundly affected dentistry have also exerted their influence upon the Council and its program. Numerous members of this group are engaged in activities bearing upon the war effort. In addition, this period of national emergency has made new demands upon the Council as a group and has served to increase the tempo of activities which have long been underway.

At this time and under these circumstances, it is pertinent to note that the

general appreciation of the scientific aspects of dentistry is increasing rather than decreasing. This is no doubt due in large measure to recognition on the part of members of the profession in both military and civil practice that science and the practice of dentistry are not separable, but are, on the contrary, interdependent.

During the past year, it has been the privilege of the Council to supply information to a large number of dental officers in our armed forces and to continue its services to dentists in civilian practice. Of importance also have been the services rendered to lay individuals and groups. The growing public interest in dentistry is reflected in the number and the character of inquiries received in the Council office.

Essential to the professional and scientific growth of dentistry are its relationships with allied scientific and professional groups. These are best developed on the basis of efforts to promote a common cause in the interest of public health. On this basis, the Council has continued its cordial relationship with the councils of the American Medical Association, the Food and Drug Administration and the Federal Trade Commission. Recognition by capable and discriminating groups that the dental profession, through its Council, can and does speak with authority on matters of importance to the public health should be gratifying to members of the profession. Individual members of the Council have also contributed to the important work of the U.S.P. Revision Committee and the Subsection on Dentistry of the National Formulary Committee.

The following items discussed or reviewed at the meeting may be of interest to members of the profession, manufacturers and others:

GENERAL RULINGS AFFECTING COUNCIL PROCEDURE

In Accepted Dental Remedies, it is stated that "the Council does not accept invitations to inspect factories; its concern is with the finished products." It was voted to amend this statement as follows: "The Council does not accept obligation to inspect factories, but reserves the privilege of inspecting the manufacturing facilities of those who have accepted products or who apply for Council acceptance of products." It must be emphasized, however, that the Council will adhere to the principle that its chief concern is with the finished product.

Minor changes affecting the rules governing the use of the Seal of Acceptance were also made. Section 5 has been changed to read:

> The size of the Seal in advertising shall not exceed one and one-half inches in height or diameter except that on enlarged reproductions of entire trade packages it shall be of a size in proportion to the package illustrated. The Seal may also be used in connection with exhibits at meetings of the American Dental Association or its recognized component societies, when a Seal up to 12 inches in height or diameter may be used. In all advertising matter, where the Seal of Acceptance is used, the Seal shall be legible, and it shall not be used in any manner which detracts from its dignity.

As stated in Accepted Dental Remedies, the object of the Council's rules is protection of the dental profession and the public against fraud or imposition, undesirable secrecy and objectionable advertising in connection with the marketing of proprietary dental articles. In conformity with the gradual evolution of its program, the Council voted to add the following to "Object of Rules":

> It is also the Council's function to promote the scientific interests of dentistry. This may be done through publication of general informative articles and of reports on the status of new articles, and by aiding in development of adequate standards for drugs and chemical agents used in dentistry.

This in no wise means that the Council's efforts to operate in conformity with the original conception of the rules will

be relaxed. It does, however, indicate in more definite terms that continually growing emphasis will be placed on educational activities of the constructive type so far as conditions permit.

SULFANILAMIDE AND RELATED COMPOUNDS

The published data on the topical use of sulfanilamide, sulfathiazole and sulfapyridine were reviewed in a recent Council report (J.A.D.A., 29:1051, June 1942). In this report, it was pointed out that much of the available evidence on this use of the sulfonamides suffers from lack of adequate control and other deficiencies. At the present time, it may be noted that claims for the usefulness of sulfanilamide and related compounds in the treatment of Vincent's infection and so-called pyorrhea and as a general prophylactic agent in uncomplicated extractions are unwarranted because of a lack of evidence. It appears probable that sulfanilamide and possibly other members of the group interfere somewhat with clot formation in the alveolus and that their use may be accompanied by a delayed healing time. It has been claimed for these compounds, and particularly for sulfanilamide, that their use results in a decrease in the pain and swelling following extraction. The Council views such general claims as unwarranted at the present time.

On the other hand, there is evidence that sulfanilamide, sulfathiazole and sulfapyridine may be worthy of trial in cases of infection in the oral cavity and in complicated extraction cases or other situations where infection may be expected to occur. For these purposes, it is not yet possible to state which of the three drugs should be employed. The choice of drug would depend in large measure on the conditions present in each case. On the basis of evidence in the medical literature, it may be surmised that crystalline sulfanilamide is the drug of choice for therapy of superficial hemolytic streptococcus infections and in the prophylaxis of contaminated wounds. Crystalline sulfathiazole appears to be the drug of choice for the local therapy of staphylococcic infections, although its low solubility confers on this compound the tendency to form a crust or to cake in wounds. The sulfonamides, according to present evidence, should not be used in combination with benzocaine or similar anesthetics related to para-aminobenzoic acid. The use of the sulfonamides in ointment form is in the experimental stage.

The Council voted to consider for acceptance brands of sterile crystalline sulfanilamide, sulfathiazole and sulfapyridine. The Council will also consider for acceptance brands of unsterilized sulfanilamide, sulfathiazole and sulfapyridine, on condition that the package labels of such products indicate clearly that the products have not been sterilized, and directions for sterilization are presented. The claims advanced for each product submitted will be reviewed in relation to this report, the report of the Council (J.A.D.A., 29:1051, June 1942) and such evidence as may, from time to time, become available. It is expected that practitioners and manufacturers will recognize that the local use of all of these compounds in dentistry is still in an undeveloped state.

On the basis of available information, it is the opinion of the Council that oral administration of the sulfonamides in general dental practice should not be encouraged. If occasions arise in which such medication seems desirable, it should be carried out in cooperation with a competent physician.

MEDICAMENTS USED IN SO-CALLED CAVITY STERILIZATION

So-called cavity sterilization is one of the old problems which are still of interest. Unquestionably, many practitioners employ some agent or agents routinely for this purpose. From time to time, there have appeared in the litera-

ture, including textbooks, reports on this topic, but some of them appear to be mainly of academic interest. A question frequently raised is: Why "sterilize" the tooth cavity at all when an unsterile filling is to be inserted subsequently? The value of "sterilization" has also been questioned in view of the assertion that, in the carious process, softening of the tooth structure precedes the penetration of bacteria. Removal of the softened dentin, it has been asserted, should be sufficient in such cases when the last step in the procedure consists in placing a satisfactory filling. On the other hand, it has been reported that the currently employed operative procedures do not remove all bacteria even from shallow cavities (Seltzer, Samuel: J.A.D.A., 27: 1799, November 1940). The question then arises as to the possible effects of these bacteria on the dental pulp. It is not at present possible to state with any degree of certainty what effect may be expected from such "residual" organisms in any given case. It is believed by some, however, that they do in some cases give rise to bacterial infection of the pulp. At the present time, it would appear that the use of so-called sterilizing agents is of greater importance in respect to protection of the pulp against bacterial infection than in prevention of recurrent caries.

In view of this fact, some importance is attached to the degree of penetration of agents used for the former purpose. Measurement of this degree of penetration has not been wholly satisfactory, but is of interest not only because of its influence on the efficacy of the germicidal agents against bacteria, but also because of the possibility that the germicidal agent itself may be harmful to the pulp. This phase of the subject has been investigated by Thomas *(J. D. Res.,* 20: 435-44, October 1941), who reports that the self-limiting action of phenol has been overestimated. His results indicate that while there may be reactions in pulps under phenolized cavities, the present evidence does not warrant condemnation of this drug for cavity sterilization. It is the Council's opinion that further work along this line, with comparison of the efficacy of various germicidal agents, should be continued.

DENTIFRICES

The status of dentifrices was reviewed. Special attention was given certain problems that have arisen in connection with the war emergency.

The uses and limitations of products of this class have been reviewed on a number of occasions. At this time, it may be pointed out that the status of dentifrices as outlined in A.D.R. should again be brought to the attention of the profession, the public and manufacturers. At a time when the need for better dental care is more fully recognized than ever before, there should be a corresponding emphasis on the practices and procedures that have been shown to be efficacious. Obviously, the dental health of the public will not be materially improved if the commendable interest that the public is now showing is met with a barrage of misleading advertising propaganda in the form of unwarranted therapeutic claims or claims based upon unimportant characteristics of individual brands of cosmetic agents. In this situation, the Council feels obliged to pursue its well-established policy of publishing reports on acceptable and unacceptable dentifrices.

Of long standing is the Council rule that dentifrices marketed in lead tubes are not eligible for inclusion in the accepted list. The basis for this ruling is so obvious as to preclude comment. Owing to the present war emergency, however, the supply of tin available for the packaging of dentifrices has been sharply curtailed. At the present writing, the amount of tin which may be used in collapsible tubes for dentifrices has been limited by the War Production Board to 7.5 per cent. In view of this circum-

stance, the Council has given extended consideration to the problems involved in packaging and sale of dentifrices in tubes composed essentially of lead, including passage of lead from the tube into the dentifrice. On the basis of information in the literature, reports and comments of consultants and information supplied by manufacturers, the Council voted to publish the following statement:

The Council views it as desirable that dentifrices be prepared and marketed lead-free. However, for the present, owing to the emergency, the Council will consider for inclusion in A.D.R. packaged dentifrices containing a maximum lead content of 20 parts per million. While the Council will consider packaged dentifrices containing as high a lead content as 20 parts per million, manufacturers and vendors of packaged dentifrices are advised that this maximum allowance is subject to revision upon establishment of more accurate data on permissible lead content. Manufacturers and vendors of packaged dentifrices are further advised that, while this maximum limit is set for the present, the Council holds it desirable and possible to prepare and market dentifrices of much lower lead content.

It will be understood that the primary concern of the Council is with the finished articles as these are supplied to the trade. It is the manufacturer's responsibility to provide articles which comply with the requirements irrespective of the type of container which may be used or may be available.

INFORMATIVE REPORTS

During the interval between annual meetings, the following informative reports have appeared in the Council's section of THE JOURNAL:

Decomposition of Procaine Hydrochloride and Related Esters in Aqueous Solution, by D. A. Wallace, Ph.D., and Harold L. Hansen, Ph.D.

Nutrition and Dental Health with Special Emphasis on Periodontal Relationships, by Dorothea F. Radusch, D.D.S., A.B., M.S.

The Bactericidal Action of an Alcoholic Solution of Formaldehyde and Sodium Borate, by J. Lewis Blass, Ph.G., D.D.S., and Norma C. Styron, M.S.

Use of Radioactive Isotopes of Elements in Biologic Investigations.

Treatment of Vincent's Infection.

The reception accorded these reports has been of such nature as to warrant continuation and, if possible, expansion of this part of the Council program. These informative articles are intended to keep the practitioner abreast of numerous developments in therapeutics and fields related to it and to serve as collateral reading for dental students and others. Participation in this effort by a number of consultants has been of value to the profession.

PROPRIETARY TOOTHACHE REMEDIES

For many years, a variety of proprietary toothache gums and drops have been offered to the public by drug concerns. The directions usually are for application in the cavity, if one is present, or for application to the gums over the tooth if no cavity is evident. In recent years, owing to the intervention of the Food and Drug Administration, the packages have usually also carried statements to the effect that the relief will be temporary and that the patient should visit his dentist for further treatment.

The current emergency is associated with an increasing interest in these preparations on the part of lay persons, who, for various reasons, may find it more difficult than formerly to secure prompt dental care. Obviously, such persons will tend to use preparations which are at hand or which have been brought to their attention in the most favorable terms. The public interest requires that emphasis be placed upon the severe limitations of any form of self-medication designed to relieve toothache. Furthermore, the public should be informed that

in cases where application of a drug seems imperative, oil of cloves will probably be as effective as the most expensive proprietary preparation.

A brief consideration of the formulae of several such preparations reveals that they make use of one or more of some of the common remedies that are used for alleviation of pulpitis by the dental profession. Among the substances used are chloroform, oil of cloves, phenol, oil of cassia, creosote and benzyl alcohol. These products vary from a simple mixture to polypharmacal preparations containing numerous ingredients. There seems to be considerable doubt whether any combination of these common substances in an expensive proprietary formula would be in any way superior to the long used oil of cloves alone. For this and other reasons mentioned here, the Council does not feel warranted in considering proprietary preparations of this class with a view to acceptance.

Furthermore, it seems obvious that such preparations would be effective only against one form of toothache, namely pulpitis in which an open cavity is present, making it possible to bring the drug in actual contact with the pulp; and even when such a cavity is present, the drug will not always reach the pulp because of overlying carious dentin or débris, which can be safely removed only by a dentist. There seems little reason to believe that the counterirritation produced by the application of such a remedy to the overlying gum tissue would be of any great value in pain relief. Since only a few of the many painful conditions called toothache by the laity fall into this group, the usefulness of these preparations seems extremely limited.

In case the pain is due to gas formation within the tooth or to periapical infection, these remedies would not only be useless, but also, because of the attempt to obtain relief with them might lead the patient to delay a necessary visit to the dentist until the infection became much more extensive and consequently more difficult to control, the tight packing of medicinal agents in tooth cavities under such circumstances might well have serious effects. Numerous other painful conditions which cannot be benefited by these remedies, but which the patient often believes to be simple toothache because of referred pain, have such sources as impaction of the teeth, the presence of neoplasms in the mouth or head, cysts, retained roots and residual areas of infection, trigeminal neuralgia, disturbances of the temporomandibular articulation, sinusitis and middle ear infections. Obviously, none of these conditions would be benefited by toothache remedies, and all of them should have the immediate attention of dentist or physician.

Further evidence that the promiscuous use of proprietary toothache drops and gums should be discouraged would seem unnecessary since: (a) there is no established need for these preparations, which have not been shown to be superior to oil of cloves; (b) their field of usefulness is extremely limited, and (c) they may be potentially harmful because their prescription by the dentist often leads to self-medication in conditions that should have the immediate attention of a dentist or physician.

PROBLEMS OF NOMENCLATURE

The Council has never attempted to determine which of the ten fundamental rules for its operation is the most important. It can be said, however, that rule 8, dealing with nomenclature, is of great importance. Members of the profession are not unmindful of the fact that the "greatest asset" of many preparations sold to the laity, and in some instances to the profession, is a "catchy" name. In some cases, the product now sold bears only a superficial resemblance to the product to which the name was originally applied. In such circumstances, it should be obvious that the practitioner who has

become accustomed to the therapeutic effects of a given agent (usually a proprietary product) may easily be misled by changes in the composition of that product. This situation provides an argument in favor of simplicity in preparations used and prescribed and, in addition, serves to indicate the desirability of names indicative of the composition of the product. Beyond this, the selection and use of names which are in conformity with the rule has an important bearing on the status of dental therapeutics in the scientific literature. A multiplicity of names, and misleading names, cannot fail to have an adverse effect on the scientific literature. Any one who has watched the growth of this literature and who has had occasion to make extensive use of it realizes the difficulties that may be imposed upon the reader by confusing or meaningless terms.

It is of importance to remember that the laws under which the Food and Drug Administration and the Federal Trade Commission operate do not make adequate provisions for handling problems of nomenclature. Therefore, the Council and the supporters of its program must bear the major part of the burden. Dentists and others connected with dentistry may assist by directing attention to and placing emphasis on adherence to the principles of scientific nomenclature. Originators of products to whom is accorded the right of naming them are urged to keep in mind their obligations to dentistry and to the public. It has been particularly gratifying to the Council to observe the growing tendency on the part of manufacturers to cooperate in matters relating to rule 8.

LOCAL ANESTHETIC SOLUTIONS

The Council has not considered it necessary or desirable in the past to insist upon rigid adherence to "standard" formulas for local anesthetic solutions. For that reason, there are minor differences in the compositions of local anesthetic solutions listed in A.D.R. These differences reside largely in differences in concentration of epinephrine and in salts used to produce isotonicity. In view of our present state of knowledge, these minor variations which do not exert a known material effect on the actions of these preparations are still permissible. The Council, however, does not view with favor the use of minor variations in formula as the basis for extravagant claims. It has not been shown that any of the local anesthetic solutions now on the market are superior to an isotonic solution containing procaine hydrochloride, epinephrine, sodium chloride and sodium bisulfite. On the other hand, they are probably inferior, except from the standpoint of convenience, to freshly prepared solutions containing no preservative.

Because the local anesthetic solutions now being sold are of necessity acidic, the Council will pay particular attention to isotonicity, pH and titratable acidity of these preparations, in addition to other well-known requirements. Attention to these features is considered of some importance in relation to possibly undesirable local effects. The Council is also aware of findings which indicate that sodium bisulfite not only contributes to undesirable local effects of these solutions, but also may increase the systemic toxic effects of epinephrine. It is not yet known precisely to what extent these effects of the use of sodium bisulfite are of importance in local anesthetic solutions. According to the available evidence, however, it would be worth while to pursue such studies farther, and especially in relation to possible substitutes for sodium bisulfite, and the influence of other factors such as pH and titratable acidity.

STERILIZATION AND DISINFECTION BY MEANS OF ULTRAVIOLET LIGHT

Because of questions received in the Council office concerning claims made for ultraviolet lamps, this topic was given

consideration. It has been asserted that instruments of this type are effective in the sterilization of dental instruments.

Recently, the Council on Physical Therapy of the American Medical Association published a report entitled "Acceptance of Ultraviolet Lamps for Disinfecting Purposes" *(J.A.M.A.,* 118:298, January 25, 1942). In this report, it was pointed out that:

In this connection, it is important to note that in order to kill a micro-organism, a direct hit by ultraviolet rays of sufficient intensity is required. This is difficult to accomplish on the edge of a drinking cup, also in a liquid containing suspended matter or in air laden with dust particles that shield the organism. As an effective germicide, a product must effect practically 100 per cent killing. Ultraviolet germicidal rays cannot penetrate deeply and hence may be absorbed by fingermarks or other contamination on a drinking cup. The ultraviolet germicidal lamp, therefore, appears to be an uncertain means of sterilizing solid objects (drinking cups, combs, brushes, shaving utensils, shoes, toilet seats), *even if irradiation of the whole surface is possible.*

"At this time, satisfactory evidence is not available to warrant acceptance of ultraviolet lamps by the Council for disinfecting solids. Furthermore, the Council is not fully convinced at the present time that it should assume the responsibility in this matter. The whole subject is too new, too complex and apparently too uncertain where virulent organisms (e.g., typhoid) may be concerned in spreading epidemics.

From this, it may be seen that claims for the usefulness of ultraviolet machines for sterilization of dental instruments do not rest on acceptable evidence. The Council on Physical Therapy does not accept ultraviolet lamps advertised as effecting sterilization of instruments. This Council recommends that dentists consider claims for ultraviolet lamps in the light of the findings of the Council on Physical Therapy.

ZINC OXIDE-EUGENOL CEMENTS

In view of the large number of inquiries on zinc oxide-eugenol cements, including those containing rosin, the referee and a consultant were requested to give further consideration to this topic. A number of reports on proprietary preparations of this class have appeared in THE JOURNAL. In A.D.R. may be found suggestions concerning the preparation and uses of zinc oxide-rosin-eugenol cements.

Questions relating to compressive strength or resistance to crushing force of these preparations come within the scope of the Research Commission. Therefore, it will merely be mentioned here that investigations along these lines have been reported (Paffenbarger, G. C., and Caul, H. J.: Dental Cements. *Proc. D. Centenary Celebration,* March, 1940, p. 232-240). Some of the results of this investigation appear in the recent report by Molnar and Skinner (J.A.D.A., 29: 744, May 1942). The latter were primarily concerned with the effects of various agents on the hardening time of these preparations. On the basis of the scanty information now available, it may be stated that the zinc oxide-eugenol cements have not been shown to possess sufficient resistance to crushing force to warrant extensive use as a base for fillings, particularly in large cavities. Their use under other cements, such as zinc phosphate, may be quite another matter. The investigation of Gurley and Van Huysen *(J. D. Res.,* 19:179, April 1940) on animals, and that of Manley (Manley, E. B.: *D. Rec.,* 62:1, January 1942) indicate that zinc oxide-eugenol cements exert a definite palliative effect when applied to the floor of deep cavities. Apparently, cavity depth is the deciding factor in pulp damage due to operative procedures.

Of practical importance in connection with the preparation of zinc oxide-rosin-eugenol cements is the quantity of accelerator used. If the preparations are made up from U.S.P. rosin, the quantity of accelerator required is less than if

powdered rosin containing a filler were employed. This should be taken into account in relation to not only the preparation of the product, but also the use to which it may be put. An increase in the quantity of a fairly soluble accelerator such as zinc acetate would be expected to increase the solubility of the set cement in water and in mouth fluids. The latter might be of some importance when the preparations are intended to be a part of a so-called permanent restoration.

ACCEPTED DENTAL REMEDIES

On the basis of the reception accorded each edition, and because of its widespread use, the Council has come to look upon Accepted Dental Remedies as one of its most important contributions to dentistry. It is recognized and appreciated that this contribution has been made possible largely because of the staunch support dentists have everywhere given this phase of the Council's program.

Preparation of the text of the eighth edition of the book is now in progress. Numerous changes will be necessary in order to bring some of the material into conformity with new editions of the National Formulary and the Pharmacopoeia of the United States.

It is of interest that Accepted Dental Remedies is widely used by officers in the armed forces. The book is also finding wide use in the Latin American countries and in various parts of the British Empire. Some countries to which copies of the book have been sent in the past are now shut off owing to the war. On the other hand, a number of copies have recently been forwarded to Russia.

DIET AND NUTRITION

The parts of Accepted Dental Remedies dealing with diet and nutrition were reviewed, especially in connection with current problems and needs. It is the opinion of the Council that these portions of the book are in need of only minor revisions.

In view of the present well-justified emphasis on nutritional problems, it is appropriate to again direct attention to some of the important facts and principles in this field.

Dentists and others interested in dental science consider foods from two standpoints: local action and systemic effects. These may or may not be intimately related in any given case. The part that local action of foods may play in periodontal conditions was reviewed in the report by Radusch. Consideration of the part that foods may play locally in dental caries is beyond the scope of this report. The available evidence, however, warrants the assertion that the per capita consumption of sugar in this country prior to rationing (103 pounds in 1939) was far in excess of necessary or desirable amounts. This is a topic of special importance in relation to dental caries and to the growth and development of the dental structures.

It is recognized that the nation's supply of fish liver oils must be conserved. The War Production Board has issued an order limiting the quantity of vitamin A in various preparations. This decision, like others, is subject to further revision at the discretion of the War Production Board. In this connection, members of the profession may be helpful by governing their actions in accordance with the established needs for vitamin A and other vitamins as well. It is well to bear in mind that an intake of dietary essentials adequate for general health is also sufficient for dental needs so far as is now known. Dentists may also be of service by emphasizing to their patients the desirability of using enriched flour and products made from it and by repeatedly directing attention to natural sources of nutrients.

EXHIBITS AND MEETINGS

In addition to the Annual Meeting of

the Association, the exhibit of the Council and the Bureau of Chemistry was shown at the following constituent and component society meetings:

Wisconsin State Dental Association, Milwaukee, Wis.

Chicago Dental Society, Chicago, Ill.

Pacific Coast Dental Conference, Portland, Ore.

Mid-Continent Dental Congress, St. Louis, Mo.

North Suburban Section, Chicago Dental Society, Evanston, Ill.

In addition to lay groups, the secretary appeared before the following groups and societies:

Lincoln District Dental Society, Lincoln, Nebr.

College of Dentistry, University of Nebraska, Lincoln, Nebr.

Northwest Missouri Dental Society, St. Joseph, Mo.

Joint Meeting, Milwaukee County Dental Society and Wisconsin Pharmaceutical Association, Milwaukee, Wis.

University of Illinois Dental School, Chicago, Ill.

Northwestern University Dental School, Chicago, Ill.

West Suburban Round Table, Oak Park, Ill.

COUNCIL CONSULTANTS

During the past year, the following men have contributed their services to the Council:

W. D. Armstrong, Ph.D., M.D., University of Minnesota.

Franklin C. Bing, Ph.D., Secretary, Council on Foods and Nutrition, American Medical Association.

J. Lewis Blass, Ph.G., D.D.S., New York, N. Y.

Howard A. Carter, B.S. in M.E., Secretary, Council on Physical Therapy, American Medical Association.

George R. Cowgill, Ph.D., Yale University Medical School.

J. J. Durrett, M.D., Director, Medical Advisory Division, Federal Trade Commission, Washington, D. C.

F. W. Hartmann, M.S., University of Michigan.

R. P. Herwick, M.D., Chief, Drug Division, Food and Drug Administration, Washington, D. C.

H. C. Hodge, Ph.D., University of Rochester.

Frank F. Kanthak, D.D.S., M.D., MC, USA.

F. D. Ostrander, D.D.S., M.S., University of Michigan.

Dorothea F. Radusch, D.D.S., M.S., University of Minnesota.

K. Salomon, Ph.D., Yale University Medical School.

E. W. Skinner, Ph.D., Northwestern University.

Austin E. Smith, M.D., Acting Secretary, Council on Pharmacy and Chemistry, American Medical Association.

Robert M. Stephan, D.D.S., Zoller Memorial Dental Clinic.

Norma C. Styron, M.S., New York, N. Y.

M. L. Tainter, M.D., Stanford University Medical School, College of Physicians and Surgeons, A Dental School.

Grant Van Huysen, D.D.S., University of Louisville.

KOPAL

ACCORDING to information supplied by Allied Products, Inc., Kopal, introduced as Tooth Luster, has the following composition: ethyl alcohol, gum sandarac, a copal resin, purified titanium dioxide and ethyl cellulose.

According to information on the package label, Kopal Remover contains alcohol 90 per cent by volume.

Some time ago, the firm directed an inquiry to the Council as to whether Kopal could be found acceptable. The firm was informed, in effect, that if therapeutic claims are not made for the product, Kopal, under the present rules, could not be considered as coming within the scope of A.D.R. Subsequently to this, there appeared in the lay press the statement that Kopal is "approved by the American Dental Association." One editor of a "beauty column" attributed this statement to an assertion on the part of a representative of the firm. The firm has informed the Council in effect that statements of this kind have not been made in advertising nor will they be made unless or until acceptance has been granted, and that, furthermore, those engaged in the distribution of the product will be informed as to the status of Kopal before the Council. Since, however, the statement that Kopal is approved by the American Dental Association has appeared in the lay press, the interests of the public, the Association and the Council require that this informative statement be presented.

Kopal (Patent No. 1712043, introduced as Tooth Luster) does not stand acceptable to the Council at the present time. The Council has not undertaken a detailed consideration of the product. Preparation of a more detailed report may be undertaken should it appear necessary or desirable.

ACCEPTED DENTAL REMEDIES

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following articles in the list of Accepted Dental Remedies.

ANESTHETICS—LOCAL*

Procaine Hydrochloride 2%, Epinephrine 1:50,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; sodium thiosulfate, 0.0013 gm.; sodium chloride, 0.00123 gm.; epinephrine (base), 0.00002 gm.; potassium sulfate, 0.0033 gm.; sodium bisulfite, 0.00067 gm.; chlorobutanol (chloroform derivative), 0.005 gm.; in double distilled water. Marketed in cartridges, approximately 2.1 cc.

Procaine Hydrochloride 2%, Epinephrine 1:25,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; sodium thiosulfate, 0.0013 gm.; sodium chloride, 0.00123 gm.; epinephrine (base), 0.00004 gm.; potassium sulfate, 0.0033 gm.; sodium bisulfite, 0.00067 gm.; chlorobutanol (chloroform derivative), 0.005 gm.; in double distilled water. Marketed in cartridges, approximately 2.1 cc.

Manufactured by Neo-Quest Chemical Company, Inc., Long Island City, N. Y. Distributed by Dental Commodities Co., New York, N. Y.

Procaine Hydrochloride 2%, Neo-Synephrin† 3:10,000-Anestex Brand: Each cubic centimeter is stated to con-

*A.D.R. Ed. 7, p. 38.

†Trademark registered U. S. Patent Office by Frederick Stearns & Co., Detroit, Mich.

tain procaine hydrochloride, 0.02 gm.; neo-synephrin hydrochloride, 0.0003 gm.; chlorobutanol (derivative of chloral), 0.005 gm.; sodium chloride, 0.0033 gm.; potassium sulfate, 0.0016 gm.; sodium thiosulfate (anhydrous), 0.001 gm.; sodium bisulfite, less than 0.00067 gm., and distilled water. Marketed in injectubes, 2.4 cc.

Manufactured by Anestex Laboratories, Pittsburgh, Pa.

Procaine Hydrochloride 2%, Neo-Synephrin (Stearns) 1:3000-Pfingst: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; sodium chloride, 0.007 gm.; potassium chloride, 0.0003 gm.; calcium chloride, 0.00025 gm.; sodium bisulfite, 0.0022 gm.; neo-synephrin (Stearns), 0.00033 gm.; in distilled water. Marketed in cartridges.

Manufactured by the Procaine Co., Inc., New York, N. Y. Distributed by A. Pfingst, New York, N. Y.

Admission of an article to the list of Accepted Dental Remedies does not imply a recommendation. Information regarding the rules and work of the Council will be sent on request.

HAROLD L. HANSEN, *Secretary.*

NATIONAL BOARD OF DENTAL EXAMINERS SUCCESSFUL CANDIDATES IN PART II MAY 4-5, 1942

Baltimore College of Dental Surgery
- Paul Maroni Edwards
- Seymour George Hyman
- Henry Robert Lasch
- Jason R. Lewis
- David Rakosky
- Sidney Rogoff
- Chester B. Ralph
- Joseph M. Tighe
- Lewis Cole Toomey
- Rosalind Irene Toubman
- Donald H. Towson

Meharry Medical College
- William Taylor Harper
- William Henry Pitts
- James Henry Williams

St. Louis University
- J. Robert Galbraith
- Salvatore Joseph Impellitteri

Northwestern University
- Robert James Curley
- Arthur Harold Gilbert

University of Nebraska
- William M. Walla
- Harold Glenroy Wallace

Temple University
- Joseph G. Fishbein

Chicago College of Dental Surgery
- Joseph H. Shor
- William T. Voigt

University of Illinois
- B. John Frey

Tufts College
- Victor Stanley Leocha
- Ralph A. Slater

University of Iowa
- Herbert C. Erbe

University of Pennsylvania
- Julius Benjamin Ratner
- Theodore L. Stein

COMMITTEE ON LEGISLATION

RECENT COURT DECISIONS

INSURANCE: X-RAY BURNS WITH RECOVERY UNDER ACCIDENT INSURANCE POLICY

THE plaintiff, a practicing dentist, had used an x-ray machine for twenty years. In taking the roentgenograms, it had long been his practice to insert the index finger of his left hand in the patient's mouth in order to hold the film firmly against the teeth. In 1936, the skin on the index finger of the left hand broke open and a secretion began to be emitted therefrom. In 1938, the skin in the palm of the left hand cracked open. In 1939, the condition became so bad that it was necessary to amputate the hand. Several months after this, the plaintiff was forced to give up practice. The plaintiff brought this suit on two accident policies which he had taken out with the defendant, both of which lapsed in 1936. The trial court rendered a verdict in favor of the defendant and the plaintiff appealed to the supreme court of Nebraska.

The first question which must be determined, said the court, is whether the facts are sufficient to establish an "accident" within the meaning of the insurance contracts. It is the contention of the defendant that while the exposure to the x-rays was accidental in the sense that it was unintentional, it was not caused by accidental means within the purview of the language of the policy. We do not think this distinction between accidental means and accidental result can properly be made, said the court. The insured did not do anything which was ordinarily considered dangerous, although the possibility of danger if the act was persisted in over a long period of time was known. The accident was not the casual exposure of the fingers to the rays, but the cumulative overdose of it, which was unexpected and unanticipated, and which resulted from almost daily exposure too long continued. The breakdown of tissues evidenced by the breaking of the skin and the subsequent cancerous condition clearly marks the date of the accident. The fact is that an external force, ordinarily not harmful, was suddenly and unexpectedly transformed into a force of violence which severely injured the plaintiff's hand. If there was an accidental result, there was necessarily an accidental means: the two cannot logically be separated.

The court next discussed the question whether the accident occurred prior to the lapse of the policies and ruled that it had. The plaintiff, said the court, became fully aware in February 1936 when the index finger of his left hand cracked open that he had suffered an injury. Certainly, the accident had then occurred and the policies did not lapse until September of the same year.

The court next considered the defendant's contention that since the plaintiff carried on his practice for two years after the date that his finger first cracked open, he was not entitled to recover because of the following words in the policy: ". . . if such injuries, independently and exclusively of all other clauses, shall wholly and continuously disable the insured *from the date of accident.*" In other words, the defendant contended

that the plaintiff literally must have been totally disabled from February 8, 1936, when the burn first appeared, in order to be entitled to insurance benefits. Under a proper interpretation of the controlling clauses of the insurance policies, said the court, the plaintiff was disabled from that date. We think, said the court, that it may be said to be a matter of common knowledge that in a great many, perhaps in a large majority of instances in which bodily injuries are received, the real nature and extent of such injuries do not reveal themselves until some time in the future and after the first pains from the hurt have passed away. In such a case, it cannot be said that the injury is not continuous and from the date of the accident, nor can it fairly or justly be said that the disability is not continuous and from the date of the accident, because the injured party enjoys a brief respite from the pain and suffering, only to be afflicted to a greater degree when perverted nature reasserts itself. Under the circumstances stated, to hold that a brief respite from the conscious ill-effects of an injury, during which respite from the conscious ill-effects of an injury the insured was able to transact his business, should bar recovery seems to us to be neither reasonable nor just. If we were not permitted to place such a construction upon the meaning of this clause in the policy, continued the court, the clause would have to be ignored under another well-established rule. This court is committed to the rule that, when the strict enforcement of a provision of an insurance policy will result in unreasonable or unjust forfeitures, or an absurd result, the courts will refuse to enforce the strict meaning of the language of the policy. The fact that the insured pursued his usual occupation or performed some or even all of his occupational duties ought not in all fairness militate against him when the more serious but hidden injury subsequently manifests itself. The strict interpretation of such a clause would lead to an unjust result in many such cases, so contrary to the general understanding of its ordinary lay meaning that the weight of authority is toward the so-called process of nature rule; that is, that when a disability follows an accidental injury within such time as the processes of nature require to totally incapacitate the injured person, such disability is immediate and, in law, begins on the date of the accident.

Lastly, the court ruled that the plaintiff was wholly and continuously disabled from attending to any and every kind of duty pertaining to his occupation on and after November 15, 1938, the date his left palm first cracked open. From and after that date, said the court, the plaintiff's left hand could not be used in his work and he was actually compelled to desist from his work. The progressive condition of the hand thereafter, cancerous in its nature, was such that additional proof is hardly necessary to establish that the plaintiff could not use it in working in the mouths of his patients. The judgment of the district court is reversed and the cause remanded with directions to enter judgment for the plaintiff in accordance with the views expressed herein.—Murphy *v.* Travelers Insurance Co. 2 N.W. 2d 576 (Nebraska 1942).

DENTAL PRACTICE ACTS—SUSPENSION OF LICENSE FOR EMPLOYING ADVERTISING SOLICITORS

THE defendant in a case of suspension of license was licensed to practice dentistry in the state of New York. In October 1940, charges of unprofessional conduct were filed against him with the department of education of the state and with the state board of dental examiners. The charges asserted that the petitioner was guilty of unprofessional conduct in violation of section 1311, sub. 2(h), of the Education Law in that, between October 1937 and August 1939, he used an advertising solicitor to obtain patients, and that, as a result of such methods, he did obtain a number of patients.

After the charges were filed, the state board of dental examiners decided that a trial was necessary and appointed a subcommittee from its members for that purpose. A copy of the charges with notice of hearing was served on the petitioner. After a hearing, the subcommittee unanimously found the petitioner guilty and recommended that he be censured and reprimanded. The board of dental examiners reviewed the record and concurred in the recommendation. The board of regents, after a hearing, on notice to the petitioner, rejected the recommendation of the board of dental examiners and voted to suspend the petitioner's license to practice dentistry for a period of six months, directing the commissioner of education to issue an order accordingly.

Thereafter, pursuant to the provisions of S.1311, sub.5, of the Education Law, the petitioner applied for an order of certiorari to review the action of the board of regents in suspending him. After a hearing, the lower court annulled the suspension order of the board of regents and, from that decision, the board of regents made the present appeal to the Appellate Division of the Supreme Court.

The law regulating the practice of dentistry in New York, said the court, provides for the suspension or revocation of a license to practice upon proof of any one of several enumerated acts. In addition, it provides the same punishment upon proof "that the dentist has been otherwise or in any other way guilty of unprofessional conduct." In amplification of the latter provision, the board of regents has adopted several rules relating to the practice of dentistry and what shall be deemed "unprofessional conduct." The fifth of these rules reads as follows: "5. Employing or making use of advertising solicitors or free publicity press agents." It is under the authority of this rule that the defendant's license was suspended.

It was shown, continued the court, that the owner of a clothing store, who also operated a dental credit business, solicited patients for the defendant and for other dentists from among the customers who came to the clothing store. Signs advertising public dental credit were located in various parts of the store. Clerks from the store physically escorted prospective patients to the defendant's office. When the patient arrived there, he was examined, a price was named for the work suggested and all financial arrangements were completed by the Dental Credit Service, which added $3 as a uniform credit charge. The prospective patient was then required to execute an assignment of wages as security for the bill. In many instances, the patient was also required to have his account guaranteed. When the work was done, all payments were made either to Dental Credit Service or to Stewart's Clothing Corp., and the dentist received 70 per

cent of the proceeds, the affiliate retaining 30 per cent. The owner of these two businesses testified that he did a large business and that he had printed and circulated in Brooklyn 100,000 circulars. Dentists were supplied with these circulars and, in three years, it was shown that the Dental Credit Service did a business of $20,000. The defendant, continued the court, admitted that, as a result of these activities, he had secured twenty-five patients whom he had never met before and who came to him solely as a result of the solicitation of the concerns operated by Smith. Testimony as to the methods of solicitation, financing and payment and the execution of wage assignments was given by many witnesses.

We have not reviewed the testimony in detail, the court continued, but, from what has been shown, it seems to us that the board of dental examiners and the board of regents were justified in finding that the petitioner was guilty of unprofessional conduct. The practices complained of were clearly of an objectionable and unprofessional nature. In the enactment of the statutes relating to the practice of dentistry, the legislature had a right to estimate the baleful effects of such practices and to put a stop to them. It was not dealing with shopkeepers and traders, but with the members of a profession treating human ailments and demanding different standards of conduct from those which are traditional in the competition of the market place.

Rule 5, said the court, cannot be said to be more restrictive than the statute which restricts advertising by various means. In view of the fact that the legislature has declared it to be unlawful for a dentist to advertise by "handbills, posters, circulars, stereopticon slides, motion pictures, radio or newspapers," regardless of whether such advertisements are true or false, it seems to us that the board of regents may forbid the use of advertising solicitors by dentists. The mere fact that the legislature has prohibited certain kinds of advertising does not deprive the board of regents of the authority to proscribe other forms which are objectionable, unprofessional and unethical. The prohibition against the use of outside solicitors surely is not more restrictive than the prohibition against advertising by the methods enumerated in the statute. Rule 5 merely serves to carry out the spirit and intent of the law and to facilitate its administration. The rules adopted by the regents governing advertising by dentists should be read in connection with the statute regulating the practice of dentistry. That statute was enacted to protect the public from imposters and charlatans who spurn the ethics of their profession and who prey upon the ignorant and the gullible. The practice of dentistry directly affects the public health, and its members should not be permitted to obtain patients by means of alluring advertisements or by solicitation through paid agents. The solicitation of patients by dentists is harmful to any community because of the opportunity it gives them to discover ailments which are nonexistent. It is the duty of the state to protect its citizens not only against incompetency, fraud and deception in the practice of dentistry, but also against practices which are calculated to demoralize the profession. We know that at some time or other practically all our citizens are obliged to consult lawyers, doctors and dentists, and few are able to judge of their qualifications in learning, skill and professional honor. It is therefore of the utmost importance that the state should enact and enforce stringent regulations regarding the conduct of practitioners in the learned professions in order that they may not be forced into an unseemly and vulgar rivalry for clients and patients in which the advantage will always be with the most unscrupulous. If a lawyer attempted to

obtain clients by the means adopted by the petitioner, he would render himself amenable to discipline under the provisions of the Judiciary Law. What would be regarded as unprofessional and unethical on the part of a lawyer should likewise be regarded as unprofessional and unethical on the part of a physician or a dentist. All three professions should be required to maintain the same high standards. When we consider the fraud and imposition that would be encouraged by sanctioning the methods adopted by the petitioner for the purpose of securing patients, the temptation to which it would subject the dentist and the danger to which it would expose the patient, we unhesitatingly reach the conclusion that the order of the special term should be reversed on the law and facts and the determination of the board of regents together with the order of the commissioner of education should be reinstated. —Cherry v. Board of Regents of University of the State of New York, 34 N.Y.S. 2d 483 (N.Y. 1942); Rubenstein v. Board of Regents 34 N.Y.S. 2d 488 (N.Y. 1942).

SUPREME COURT UPHOLDS MICHIGAN LAW

WORD has been received that the United States Supreme Court has dismissed the appeal of a group of advertising dentists who contended that the Michigan Dental Practice Act is unconstitutional. The Michigan Supreme Court, from whose decision the advertising dentists appealed, had previously upheld the constitutionality of the law.

It is expected that this refusal of the Supreme Court to alter the decision of the Michigan Court will end the legal battle which has been going on ever since the law was enacted in 1939. The advertising dentists have fought the law in every possible way, even to the extent of forcing a public vote on the question whether the law should be retained. When this vote resulted in an overwhelming approval of the law, the advertising dentists alleged that the vote was not properly conducted and therefore invalid and that the law was also unconstitutional.

All of the courts which have considered the case have ruled in favor of the validity of the referendum as well as the constitutionality of the act. Since the United States Supreme Court is the highest court to which an appeal can be made, it is apparent that this avenue of objection has been exhausted and that the temporary injunction restraining the Michigan State Board of Dental Examiners from enforcing the act against these dentists will shortly be dissolved.

COMMITTEE ON ECONOMICS

A MEETING OF INDUSTRIAL DENTISTS

FOR several years, the Committee on Economics has been aware of the importance to organized dentistry of the expanding field of industrial dental service. Following the earlier lead of E. L. Pettibone and others, investigations were started by the Committee on Economics to determine the number of industrial plants offering dental services to their employes and to determine the type of service being offered by these programs. The findings of these investigations made clear the need for the establishment of a set of standards that would represent the position of the American Dental Association with regard to the basic plan of organization and operation of industrial dental programs. The Committee on Economics drew up such a set of standards and submitted them to the House of Delegates of the American Dental Association at the Annual Meeting of 1941. The standards were approved and are now in effect.

Interest in industrial dentistry has been increasing for several years, and the industrial expansion resulting from the war effort has given impetus to the establishment of new programs of this type. The United States Public Health Service also recognizes the importance of industrial dental health programs, and recently appointed Lyman D. Heacock to act as a consultant in this field.

It is the opinion of the Committee on Economics that the industrial dental program is now of such magnitude as to justify the establishment of a formal organization of dentists employed in this field. Such an organization would provide a medium of exchange for the specialized information gleaned from experience by men engaged in this type of dental practice. It would make possible the development of more uniform standards of practice in industrial dental practice. Furthermore, such an organization would be able to establish and maintain control of industrial dental practice in order that the best interests of organized dentistry might be served.

The Committee on Economics is of the opinion that their work in connection with industrial dentistry has been carried as far as the proper function of the committee provides. While the committee will continue to be interested in the work in this field and will keep informed regarding it, the feeling of this group is that the time has come when some other group should assume the leadership in this field. It would seem that no group is better qualified to do this than the men actually engaged in this type of practice. Consequently, a meeting is being called, in connection with the Annual Meeting of the American Dental Association at Boston, of all dentists engaged in some aspect of industrial dentistry for the purpose of considering the advisability of creating a permanent organization of industrial dentists.

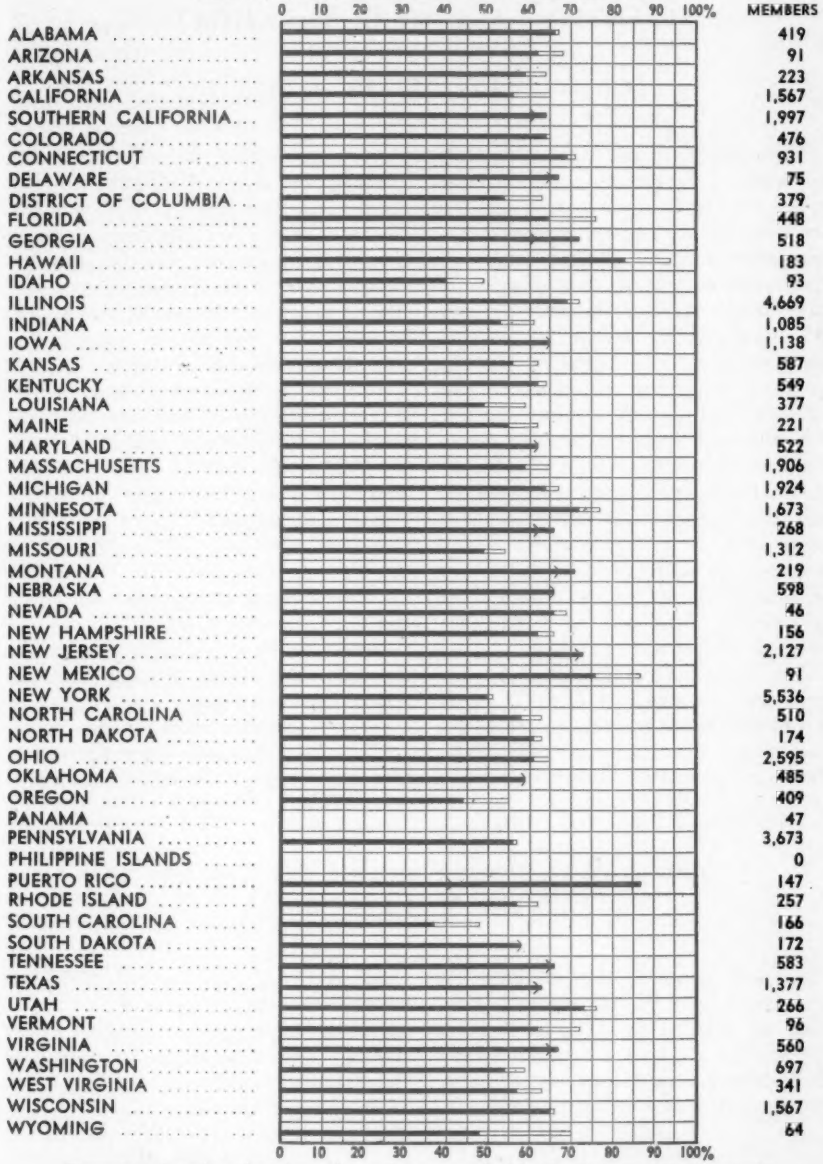
The meeting will be held Tuesday morning, August 25, at 10:00 a.m. in the Salle Moderne at the Statler Hotel. Since it is possible that it may be necessary to change the date of this meeting, the JOURNAL should be consulted for further announcements.

All dentists engaged in industrial dental practice are urged to attend.

R. M. WALLS, *Chairman,*
M. L. DOLLAR, *Secretary.*

Membership Page

PERCENTAGE OF DUES RECEIVED IN CENTRAL OFFICE AS OF MAY 31, 1942, AS COMPARED TO 1941 MEMBERSHIP



Percentage based on dental population figures supplied by the State Society Secretaries.

1942 percentage. 1941 percentage.

NEWS ITEMS

SCIENTIFIC AND HEALTH EXHIBITS

BOSTON, MASS., AUGUST 24-28, 1942

HAVE you heard the latest news from the Selective Service System? As fast as news is printed, new developments take place. Only dentists in direct contact with Selective Service offices or representatives will be in a position to offer factual up-to-the-minute information. Realizing the importance of personal contact, the Selective Service System is presenting an exhibit in the Scientific and Health Exhibits Section at Boston next August. Informed Selective Service personnel will graphically explain the newer methods employed by their department and will answer all questions on the subject asked by A.D.A. members. Of course, this will strengthen the military thread woven through the tapestry of American Dentistry—the Scientific and Health Exhibits.

The visual education aspect of the exhibits will be strikingly new. The Preview Committee is enthusiastic about this year's finer new motion pictures. New effects are produced in full color pictures supported by the use of animated cartoons and many of amateur cinemaland's and Hollywood's best methods. New motion pictures have been produced by dentists to demonstrate the latest developments of dental technic and science. This is not a new feature of the Annual Meeting, but the motion pictures are new. Don't miss them.

Just to refresh your mind: These Scientific and Health Exhibits, including motion pictures, will be held in Mechanics Hall at the Annual Meeting of the American Dental Association in Boston, August 24-28, 1942. Many of our friends regretted their lack of foresight in reserving only a few hours for the exhibits at the meeting last year in Houston.

Reserve part of your first day for the Scientific and Health Exhibits and you will be back every day.

SCIENTIFIC AND HEALTH
EXHIBITS COMMITTEE,
LEO F. MARRÉ, *Chairman.*

LIAISON OFFICER ASSIGNED TO AMERICAN DENTAL ASSOCIATION

MAJOR Kenneth R. Cofield (DC) has been assigned to the Sixth Corps Area Office by order of the Surgeon General with additional duties of acting as liaison officer between the United States Army and the American Dental Association.

Major Cofield has just returned from fourteen months service in the field. His previous assignment was at Fort Oglethorpe, Georgia, where he has served as the executive officer of the Sixty-Fifth Medical Regiment.

ARMY DENTAL CORPS PROMOTIONS

(RANK FROM FEBRUARY 1, 1942)

LIEUT. COLONEL TO COLONEL

Lieut. Colonel William D. White
Lieut. Colonel Neal A. Harper
Lieut. Colonel Earle J. McClung
Lieut. Colonel Daniel Bratton
Lieut. Colonel Earl L. Hering
Lieut. Colonel Walter D. Vail
Lieut. Colonel Dell S. Gray
Lieut. Colonel George R. Kennebeck
Lieut. Colonel William F. Scheumann
Lieut. Colonel Page P. A. Chesser
Lieut. Colonel Walter D. Love
Lieut. Colonel Robert C. Craven

MAJOR TO LIEUT. COLONEL

Major James M. Epperly
Major (temp.) William T. Williams
Major George E. Paskopoulos
Major Archibald Turner Devall
Major William Perry
Major George Shadford Easton
Major Ivan Herbert Northfield
Major Harold C. Percival

CAPTAIN TO MAJOR

Captain Howard N. Burgin
Captain Robert E. Hammersberg
Captain Dean S. Beiter
Captain Oscar J. Ogren
Captain George F. Jeffcott
Captain Carvel C. Ellison
Captain Edgar Gunther
Captain Stanley F. Steele
Captain Jack M. Hawkins
Captain Edward G. Austin
Captain Wayne A. Hayes
Captain (temp.) Scott D. Linn
Captain (temp.) George B. Foote
Captain (temp.) James P. Williams
Captain (temp.) Raymond J. Talbot
Captain Erwin William Ferber
Captain Frank E. Rossman
Captain William Middleton
Captain Lyndon S. Wilder
Captain Frank Pinkard Campbell
Captain Louis B. Schoel
Captain Crandall Isaac Koons
Captain Paul W. Holter
Captain Ellsworth K. Kelly
Captain Walter J. Reuter
Captain Martin F. Sullivan
Captain Glynn B. Widner
Captain James S. Pegg
Captain Frank G. Bolton
Captain Charles S. Winston
Captain Herbert L. Gullickson
Captain Donald C. Hudson
Captain William J. McAllister
Captain (temp.) John P. Christensen
Captain (temp.) Charles H. Traynham
Captain Clarence Duncan Llewellyn
Captain Milton E. Nicholson
Captain Lewis Houston Locker
Captain Philip G. Rudin
Captain Ross Jay Weir
Captain James P. Spellman
Captain Nicholas Jordan Akridge
Captain Bernice J. Cehrs
Captain Harold Julian Choate
Captain Walter J. Kennedy
Captain Joseph Paul Fleming
Captain George Geller
Captain Barney B. Bishop
Captain John Murray O'Connor
Captain William E. Tripp
Captain Maxwell Jack Rosenthal
Captain Jean H. Romaine
Captain Bernard Eugene Smyers
Captain Alonzo L. Foulk
Captain Arthur Donald Strathern
Captain Milton D. Andrain
Captain James Alfred McBrien
Captain Ralph H. McGoogan
Captain Lawrence Edwin Totten
Captain Sam A. Caniglia
Captain Ralph David Watkins
Captain George T. Caen
Captain Marshall Lamar Jones
Captain Samuel S. Mervine
Captain Martin B. Feese
Captain Harry Robert Carney
Captain Charles D. Henderson
Captain Orlyn D. Gingrich
Captain Albert L. Miller
Captain Elton Vincent Faass
Captain Frank O. Raasch
Captain Everett C. Claus
Captain Robert R. Ebersole
Captain Robert William Schott

Captain Arnold H. Feldman
Captain Seymore C. Warady
Captain Abraham Greines
Captain Ellison Barnard Weaver
Captain Henry F. Stavinoha
Captain Eugene H. Taylor
Captain Herbert L. Davidson
Captain John Baptiste Rago
Captain Conrad C. Gilkison
Captain Donald H. Webster
Captain Fred H. Worthington
Captain Russell A. Sand

1ST LIEUT. TO CAPTAIN

Lieut. Hazle Padgett Beasley
Lieut. Harry Goldberg
Lieut. James Meredith Klewans
Lieut. Joseph Herbert Rutherford
Lieut. Richard Eugene Taylor
Lieut. Walter Bruce White
Lieut. Lester Werther
Lieut. Lloyd Charles Carroll
Lieut. Willis Victor Goller
Lieut. Lewis Allan Imerman
Lieut. William Frederick Maury
Lieut. Victor Baudean Marquer
Lieut. Lacy Hamilton Bell
Lieut. Wylie Lew Clyde
Lieut. Joseph Woodrow Fleming
Lieut. Bernie Urissie Foster
Lieut. Donald Byron McAllister
Lieut. Edgar O'Quinn
Lieut. Alfred Carl Petersen
Lieut. William Harold Pretty
Lieut. Edwin Frank Ryon
Lieut. Robert Clyde Cogswell
Lieut. Hugh McCall Daniel
Lieut. William Newton Garmany
Lieut. Samuel Brandes Wylie
Lieut. Clyde Wentworth Caldwell
Lieut. Leo Ralph Leon
Lieut. Gerald Francis Bredburg
Lieut. James Henry Mahoney
Lieut. Sarkis Shaghallian
Lieut. Leo Francis Geoghegan
Lieut. Marvin Eugene Tritsch
Lieut. Kenneth Maxwell Davis
Lieut. Charles Frederick Rossell
Lieut. Leon H. Meinster
Lieut. Leo Bernard Wigdor
Lieut. Samuel X. Kaplan
Lieut. Ervin John Anderson
Lieut. William Henry Walker
Lieut. Robert Emery McClure
Lieut. Ottmar Alfred Breiling
Lieut. Byron Leonard Carpenter
Lieut. Arthur Henry Wegner
Lieut. Matthew Paul Pupilla
Lieut. Norman Edward Ruediger
Lieut. Festo Edward Giese
Lieut. Sidney Merrill Goodstein
Lieut. Fred Joseph Leonard
Lieut. Perry Milton McNeil
Lieut. Glen Russell Pierson
Lieut. Morris Manne Robinowitz
Lieut. George Cohen Shuman
Lieut. Harold Alexis Wilson
Lieut. Eldon Robert Woolsey
Lieut. Louis Robert Morris
Lieut. George Spencer McClench
Lieut. Cecil Robert Fox
Lieut. Jesse Lee Windham
Lieut. Jerry Novak
Lieut. Marcus Milton Weisman
Lieut. Andrew Crosby Kimble
Lieut. William Benjamin Irby
Lieut. Crawford Shelley Douglass
Lieut. Norbert Aloisius Herald
Lieut. William Oscar Van Brunt
Lieut. Leon H. Ashjian
Lieut. Irving Gilbert
Lieut. Morton Franklin Dryden
Lieut. Edward Joseph Temple
Lieut. Fred Goldsmith Rollins
Lieut. Roy Rutherford Brown
Lieut. Leo Irving Berg
Lieut. Arlie B. Gardner
Lieut. James R. Garner
Lieut. Clyde J. Ingels
Lieut. William F. Peacock
Lieut. Everett Lloyd Earsley
Lieut. Arthur Frank Birk
Lieut. Edward Everett Wheeler
Lieut. Walter Henry Vendes
Lieut. Hugh Moseley
Lieut. Hayde Walker Crowell
Lieut. Sidney Borsuk
Lieut. Edward Paul Boller
Lieut. Henry Walden Cayton
Lieut. Carl Joseph Gumbert
Lieut. John Gilbert Hudgins
Lieut. Alfonso Amore Perna
Lieut. Harlan Parker Edmonds, Jr.
Lieut. James Frederick McClaren
Lieut. Ralph Pauling Turnbull
Lieut. Frank A. Allenberg
Lieut. John F. Hewes III
Lieut. Seymour Pollan
Lieut. Raymond B. Kelsey
Lieut. Lon W. Lyle

Lieut. Phil H. Kleppinger
Lieut. Marvin E. Judd
Lieut. William E. Johnson
Lieut. Philip S. Brackett
Lieut. Howard D. Slack
Lieut. James E. Berg
Lieut. Robert N. Knutson
Lieut. Howard Hofer, Jr.
Lieut. Dale W. Harvey
Lieut. Milton M. Kenny
Lieut. Charles N. Thurwachter
Lieut. Don J. Killebrew
Lieut. Alfred Abraham Dolgin
Lieut. Robert Wilkins Hatton
Lieut. John Patrick Mahoney
Lieut. George Henry Spicer
Lieut. James Tracy McKissick
Lieut. Theodore Chester Shea
Lieut. Robert Green Wight
Lieut. James William Adams
Lieut. Douglas Lewis
Lieut. Meyer Alpern
Lieut. William H. Trimble
Lieut. Robert W. Hare
Lieut. Howard E. Spicer
Lieut. Richard E. Martin, Jr.
Lieut. Luke D. Smith
Lieut. Samuel Schwartz
Lieut. Lucien A. Remy
Lieut. Theodore J. Post
Lieut. William S. Painter
Lieut. John L. Keeshan
Lieut. Victor L. Beck
Lieut. Joseph Jacobson
Lieut. Joseph R. Brown
Lieut. Lloyd M. Cox
Lieut. Harry H. Cook, Jr.
Lieut. William W. Campbell
Lieut. Emanuel Davis
Lieut. George W. Brownridge
Lieut. John S. Egenberger
Lieut. Stanton N. Bordner
Lieut. Dean C. Klevan
Lieut. William W. Bushnell
Lieut. Max W. Lyon
Lieut. James H. Davis
Lieut. Elmer H. Chester
Lieut. Carl W. Zink
Lieut. David L. Francis
Lieut. Don T. McKee
Lieut. William M. Harley, Jr.
Lieut. Alfred M. McQuay
Lieut. Carl M. Hood
Lieut. Robert B. Millstone
Lieut. Stephen F. Smolczynski
Lieut. Ever J. Ogesen
Lieut. Louis Clyde Smith
Lieut. David M. Reese
Lieut. Marshall H. Huey, Jr.
Lieut. Francis M. Schmitt
Lieut. Charles H. Nash, III
Lieut. Werner G. Sittler
Lieut. Frank R. Pittman
Lieut. Charles E. McCracken
Lieut. Harry R. Pittman
Lieut. Manuel M. Maslansky
Lieut. Hyram J. Sedwick
Lieut. John R. O'Brien
Lieut. Nolan N. Sullivan
Lieut. Leo W. Allred
Lieut. Grant N. Bridges
Lieut. Maurice F. Ekstrom
Lieut. Clyde J. Bresnan
Lieut. Charles B. Hamilton
Lieut. Thomas H. Waits
Lieut. Abraham S. Shubow
Lieut. Alfred F. Frey
Lieut. John L. Smith
Lieut. Joseph Isadore Saposnik
Lieut. Jerome C. Wilson

APPOINTED FIRST LIEUTENANTS REGULAR ARMY

1st Lieut. George N. Schulte, Dental Reserve
1st Lieut. Edwin H. Smith, Jr., Dental Reserve
1st Lieut. Julius C. Sexson, Dental Reserve
1st Lieut. Frank A. Mitchell, Dental Reserve
—*Army D. Bull.*, 13:150-153, April 1942.

DR. RANKIN RETIRES FROM MEDICAL ADVISORY BOARD, OCD

FRED W. RANKIN, Lexington, Ky., retired as a member of the Medical Advisory Board of the Office of Civilian Defense upon being called to active service in the office of the Surgeon General of the Army. John T. O'Rourke, dean of the University of Louisville School of Dentistry, Louisville, Ky., has been designated to fill the vacancy on the board.

RUBBER SALVAGE DRIVE

THE War Production Board has requested publication of the following:

Without rubber we can't win this war! Your Government asks you to *turn in at once* all the old, unused rubber in your possession!

Take anything, everything made of rubber, to any gasoline service station *today*. They'll pay you one cent a pound. Remember . . . your Government urges you to do this immediately. *Victory Rides on Rubber!*

PHILIP W. WOODS JOINS THE FARM SECURITY ADMINISTRATION

Philip W. Woods, former secretary of the Maine Dental Society and former director of the Division of Dental Health of the Maine State Bureau of Health, May 18 joined the staff of the U. S. Department of Agriculture Farm Security Administration.

Dr. Woods and Edward W. Neenan, who has been with the Farm Security Administration for the past two years, will share responsibility for developing the dental service phase of the departments of health program for low-income farmers and farm laborers.

GREETINGS FROM THE DENTAL STUDENTS OF GREAT BRITAIN TO THE DENTAL STUDENTS OF THE UNITED STATES OF AMERICA

DURING the Easter season, the elected representatives of the British dental schools met in conference at Manchester (England), and unanimously resolved to send the following message of greeting to the dental students of the United States of America:

"We, the dental students of the United Kingdom greet the dental students of the United States of America. We strive to make ourselves competent to play our part in caring for the health of our nation, particularly the fighting forces, and the children, who, we hope, will grow up to enjoy the liberty for which our countries are fighting side by side.

"Let us have faith that right makes might. Let us have faith to dare. . . ."

PAUL SHEPHERD,
On behalf of the dental
students of Great Britain.

CORRESPONDENCE

"COMPLICATIONS ASSOCIATED WITH THE THIRD MOLAR TEETH"

To the Editor:

In a paper in the June 1 issue of THE JOURNAL, under the above title, the author, J. R. Cameron, says, "When the gum over a partly erupted lower third molar is adherent and swollen and trismus is present or in the process of developing, lancing of the gum with the scalpel or the cold cautery is indicated."

Such advice to the dental practitioner who does not have too great an experience with the various acute phases of pericoronal infection may lead to serious error. In October 1929, in a paper published in the *Dental Cosmos* on the multiple stage treatment of the pathologic third molar, I said, in connection with these conditions, "In many cases when the tissues about the tooth are inflamed, futile attempts are made to aid eruption by incision through the overhanging operculum. We are fully in accord with Blum and others who consider this procedure ill advised *except for the purpose of evacuating a localized abscess.*"

Acute pericoronal infection about the lower third molar begins as a mild inflammatory reaction about the exposed portion of the tooth. As the infection advances, a larger area of soft tissue becomes involved on both the lingual and the buccal aspect. The tissues are engorged and extremely tender to the touch. Vincent's organisms, in a very high percentage of cases, are secondary invaders at this stage. Trismus has begun and is progressive. The patient is ill, with a definite elevation of temperature. At this stage, there has been no localization of the infection and fluctuation is absent. This, in my opinion, is precisely the most dangerous stage for surgical intervention of any kind.

I am certain that it was not Dr. Cameron's intention to advise incision in the situation that I have described, but I am writing to clarify a misinterpretation which I placed on the paragraph when reading it.

HARRY J. FIELD, D.D.S.,
130 Market St., Newark, N. J.

"PROPHYLACTIC USE OF SULFAPYRIDINE"

To the Editor:

In "Prophylactic Use of Sulfapyridine in Patients Susceptible to Subacute Bacterial Endocarditis Following Dental Surgical Procedures," in the March 1942 issue of THE JOURNAL, Drs. Budnitz, Nizel and Berg state that, in a definite number of cases, a transitory bacteremia followed removal of infected teeth, and that the bacteremia resulted from "rocking" of the tooth in its alveolus during its extraction.

After studying the case presented by these authors for prophylactic sulfapyridine therapy, my question is this: What proof have we that the bacteremia found shortly after the extraction of the infected teeth was not present prior to extraction, through absorption by way of the root ends into the blood circulation? The authors may have made examinations prior to extraction of the teeth to determine whether *Streptococcus viridans* was present in the blood stream, but there was nothing in the article referred to that makes this point clear. At the present time, I question whether *Streptococcus viridans* found in the blood stream after extraction of the teeth might not have been present prior to the surgical procedure.

M. HILLEL FELDMAN, D.D.S.,
730 Fifth Ave., New York, N. Y.

AMERICAN DENTAL ASSOCIATION EIGHTY-FOURTH ANNUAL MEETING

BOSTON, MASSACHUSETTS, August 24, 25, 26, 27, 28, 1942

OFFICIAL CALL

To the Members of the American Dental Association:

You are hereby notified that the Eighty-Fourth Annual Meeting of the American Dental Association will be held in Boston, Mass., August 24-28, 1942.

The House of Delegates will convene at 10:00 a.m., Monday, August 24. The second session will be held at 2:00 p.m., Monday, August 24; the third session at 2:00 p.m., Wednesday, August 26, and the fourth session at 2:00 p.m., Thursday, August 27. The four sessions of the House of Delegates will be held in the Ballroom of the Hotel Statler. The Credentials Committee will register Delegates and Alternates, beginning at 10:00 a.m., Sunday, August 23, at the Hotel Statler.

All other members will register at the Registration Office in the Mechanics' Building. The Registration Department will be open from 9:00 a.m. to 5:00 p.m., Sunday, August 23, and Monday, Tuesday, Wednesday and Thursday and until noon Friday, August 24, 25, 26, 27 and 28.

The General Session which constitutes the opening exercises of the Meeting will be held Tuesday, August 25, at 9:30 a.m. The second General Session will be held Tuesday evening, August 25, at 8:00 p.m. The two General Sessions will be held in the Ballroom of the Hotel Statler.

The constituent societies are notified to file with the Secretary of this Association, at least thirty days prior to the first day of the Annual Meeting a list of the names and addresses of their Delegates and Alternates.

OREN A. OLIVER, *President.*
HARRY B. PINNEY, *Secretary.*

COMMITTEE ON LOCAL ARRANGEMENTS, EIGHTY-FOURTH ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION, BOSTON, MASS., AUGUST 24-28, 1942

GENERAL PROGRAM

Registration (General) ..... Sunday, August 23, 9:00 a.m.
(Mechanics' Building)

Registration (Delegates and Alternates) ..... Sunday, August 23, 10:00 a.m.
(Georgian Room, Hotel Statler)

Board of Trustees (First Session) ..... Friday, August 21, 10:00 a.m.
(Hotel Statler)

Board of Trustees (Second Session) ..... Saturday, August 23, 10:00 a.m.
(Hotel Statler)

House of Delegates (First Session) ..... Monday, August 24, 10:00 a.m.
(Georgian Room, Hotel Statler)

House of Delegates (Second Session) ..... Monday, August 24, 2:00 p.m.
(Georgian Room, Hotel Statler)

House of Delegates (Third Session) ..... Wednesday, August 26, 2:00 p.m.
(Georgian Room, Hotel Statler)

House of Delegates (Fourth Session) ..... Thursday, August 27, 2:00 p.m.
(Georgian Room, Hotel Statler)

PRELIMINARY PROGRAM FOR THE BOSTON MEETING

FIRST GENERAL SESSION

(Ballroom, Hotel Statler)

TUESDAY, AUGUST 25

9:30 a.m. Music

9:45 Invocation

9:50 Greetings from the State of Massachusetts
Governor Leverett Saltonstall ..... Boston, Mass.

10:00 Greetings from the City of Boston
Mayor Maurice J. Tobin ..... Boston, Mass.

10:10 Address: "The Dental Corps at War"
Rear Admiral Ross T. McIntire, United States Navy ..... Washington, D. C.

10:50 Introduction of foreign guests

11:00 Address by the President
Oren A. Oliver ..... Nashville, Tenn.

11:30 Music

SECOND GENERAL SESSION

(Ballroom, Hotel Statler)

TUESDAY, AUGUST 25

8:00 p.m. Music

8:15 Address: "The War Rôle of the Dentist."

Paul V. McNutt.....Washington, D. C.

Music

WEDNESDAY EVENING

AUGUST 26

DINNER DANCE

AND

FLOOR SHOW

In honor of the President, Oren A. Oliver

(Ballroom, Hotel Statler)

THURSDAY EVENING

AUGUST 27

Entertainment (Complete details in Official Program.)

F. E. GRANT, *Chairman,*
Entertainment Committee.

SECTION OFFICERS—CHAIRMEN AND SECRETARIES—EIGHTY-FOURTH ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION, BOSTON, MASS., AUGUST 24-28, 1942

THE SCIENTIFIC SECTIONS

TUESDAY AFTERNOON, AUGUST 25

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Mechanics' Building, Room B)

OFFICERS OF SECTION

E. M. Jones, Chairman.....122 E. 16th St., Los Angeles, Calif.
J. B. Hutcherson, Vice Chairman.....Starks Building, Louisville, Ky.
C. D. Fleetwood, Secretary.....Medical & Dental Building, Seattle, Wash.

2:30 to 5:00 p.m.

Symposium—Preventive Dentistry
Philip Jay, Chairman.....Ann Arbor, Mich.
2:30 p.m. "Periodontia and Its Relation to Preventive Dentistry"
Arthur H. Merritt.....New York, N. Y.
3:15 p.m. "Procedures Available for the Prevention of Dental Diseases in Children"
John C. Brauer.....Iowa City, Iowa
4:00 p.m. "Rôle of Fluorides in Preventive Dentistry"
F. A. Arnold, Jr.....Bethesda, Md.

FULL DENTURE PROSTHESIS

(Mechanics' Building, Room E)

OFFICERS OF SECTION

W. W. Hurst, Chairman.....2165 Adelbert Road, Cleveland, Ohio
Homer Simpson, Vice Chairman.....Medical Arts Building, Dallas, Texas
C. O. Flagstad, Secretary.....Medical Arts Building, Minneapolis, Minn.

2:30 to 5:00 p.m.

2:30 p.m. "Oral Surgical Technic in the Removal of Torus Palatinus and Torus Mandibularis to Facilitate Denture Prosthetics" (Illustrated with colored motion pictures)
Jack Werner.....San Francisco, Calif.
3:15 "Graphic Interpretation of the Structures Influencing Mandibular Denture Mucoperipheral Outline Form" (Illustrated with Kodachrome slides)
Roland D. Fisher.....Glendale, Calif.
4:00 "Complete Denture Service with Balanced Functional Occlusion Using Each Patient as His Own Articulator" (Illustrated with motion pictures)
Central Nebraska Study Club
F. T. Daly.....Cambridge, Nebr.
J. G. Colgan.....McCook, Nebr.
A. R. Transue.....Lexington, Nebr.

PARTIAL DENTURE PROSTHESIS

(Mechanics' Building, Room H)

OFFICERS OF SECTION

Oliver C. Applegate, Chairman.....216 S. State St., Ann Arbor, Mich.
Charles Peterka, Vice Chairman.....LaSalle Building, Minneapolis, Minn.
A. O. Klaffenbach, Secretary.....University of Iowa, Iowa City, Iowa

2:30 to 5:00 p.m.

2:30 "Casting Problems"
Ernest R. Granger.Mount Vernon, N. Y.
3:15 "Combining Partial Denture and Fixed Dentures for Mechanical and Functional Coordination"
A. W. Sears.....Jacksonville, Fla.
4:00 Topic Discussion: "Removable Partial Dentures"
Luzerne G. Jordan, Chairman.....Washington, D. C.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Mechanics' Building, Room C)

OFFICERS OF SECTION

J. Holden Beckwith, Chairman.....Ingraham Building, Miami, Fla.
George W. Christiansen, Vice Chairman...David Whitney Building, Detroit, Mich.
Frank B. Hower, Secretary.....Heyburn Building, Louisville, Ky.

2:00 to 5:30 p.m.

2:00 "Mouth Health in Industry"
Earle H. Thomas.....Chicago, Ill.
2:45 "The Roentgenogram, a Guide in Oral Surgery and Exodontia"
L. R. Main.....St. Louis, Mo.
3:45 "Electrosurgery and Its Application to Dentistry"
William I. Ogus.....Washington, D. C.

ORTHODONTICS

(Mechanics' Building, Room G)

OFFICERS OF SECTION

L. B. Higley, Chairman.....705 S. Summit St., Iowa City, Iowa
Frank W. Nash, Vice Chairman.....Medical Arts Bldg., Scranton, Pa.
F. Copeland Shelden, Secretary.....315 Alameda Road, Kansas City, Mo.

2:30 to 5:00 p.m.

2:30 "Orthodontic Diagnosis"
Thomas D. Speidel...Indianapolis, Ind.

3:15 "Certain Aspects of Skull Growth as Shown by Lateral Head X-Ray Films"
R. M. McDowell.....Denver, Colo.
4:00 "Classification, Degree and Prognosis of Root Resorption"
Hermann Becks....San Francisco, Calif.

PERIODONTIA

(Mechanics' Building, Room D)

OFFICERS OF SECTION

Hunter S. Allen, Chairman.....
.....Comer Building, Birmingham, Ala.
Harold J. Leonard, Vice Chairman.....
....630 W. 168th Street, New York, N. Y.
J. A. Jacobsmeyer, Secretary.....
.....Paul Brown Building, St. Louis, Mo.

2:30 to 5:00 p.m.

2:30 "Soft Tissue Lesions of the Mouth of Local and General Origin"
Theodor Blum.....New York, N. Y.
3:15 "Diagnostic Procedure in Periodontal Practice"
E. Romle Romine.....Detroit, Mich.
4:00 "Difficulty of Completely Removing Subgingival Calculus"
Charles F. Bodecker...New York, N. Y.
4:20 "Acute Herpetic Gingivostomatitis"
Daniel E. Ziskin.....New York, N. Y.
Margaret Holden .....New York, N. Y.

DENTISTRY FOR CHILDREN AND ORAL HYGIENE

(Mechanics' Building, Room A)

OFFICERS OF SECTION

Kenneth A. Easlick, Chairman.....
University of Michigan, Ann Arbor, Mich.
Robert A. Downs, Vice Chairman.....
.....State Office Building, Denver, Colo.
Ralph L. Ireland, Secretary.....
.....Andrews Hall, Lincoln, Nebr.

2:30 to 5:00 p.m.

2:30 "Education and Abnormal Pressure Habits"
George W. Teuscher.....Chicago, Ill.
3:15 "Introducing Dentistry to the Child"
Ralph L. Ireland.....Lincoln, Nebr.
4:00 "Guiding the Child's Dentition to Adult Efficiency"
L. B. Higley.....Iowa City, Iowa

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Mechanics' Building, Room F)

Hermann Becks, Chairman.....
..Univ. of California, San Francisco, Calif.
Basil G. Bibby, Vice Chairman.....
.....416 Huntington Ave., Boston, Mass.
Robert G. Kesel, Secretary.....
.....808 S. Wood Street, Chicago, Ill.

2:30 to 5:00 p.m.

2:30 "Bactericidal Value of Sulfanilamide and Allied Compounds"
Fred R. Adams.....New York, N. Y.
3:15 "Physiopathologic Action of Local Anesthetics"
Sergio Varela.....Mexico City, Mexico
4:00 "Galvanism from Dental Metals"
Harold A. Salomon.....Buffalo, N. Y.

WEDNESDAY MORNING, AUGUST 26

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Mechanics' Building, Room B)

9:30 a.m. to 12:00 m.

9:30 "Root Canal Sterilization by Desiccation; Electrosurgery"
M. K. Baklor.....Baltimore, Md.
10:15 "Esthetic Restoration of the Proximal Surfaces of the Anterior Teeth"
A. W. Jeffery.....Seattle, Wash.
11:00 "Relative Size of Instruments Used in Cavity Preparation in Reference to Dentin and Enamel"
LeRoy L. Hartman....New York, N. Y.

FULL DENTURE PROSTHESIS

(Mechanics' Building, Room E)

9:30 a.m. to 12:00 m.

9:30 "A Diagnosis of Problems in Complete Denture Prosthesis"
Harry A. Young.....New York, N. Y.
10:15 "Green and Red Lights in Impression Taking" (Illustrated)
Ervin S. Ulsaver....New Rochelle, N. Y.
11:00 "Anatomic and Non-Anatomic Teeth" (Illustrated with lantern slides)
LeRoy E. Kurth.....Chicago, Ill.

PARTIAL DENTURE PROSTHESIS

(Mechanics' Building, Room H)

9:30 a.m. to 12:00 m.

9:30 "Occlusion in Partial Denture Prosthesis"
Vincent R. Trapozzano.New York, N. Y.
10:15 "Acrylic Teeth as a Means of Obtaining Balanced Functional Occlusion in Partial Denture Prosthesis"
William R. Mann....Ann Arbor, Mich.
11:00 "Significance of Resistance and Retention Form in Inlay Preparation"
P. M. Kyprie.....Detroit, Mich.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Mechanics' Building, Room C)

9:30 a.m. to 12:15 p.m.

9:30 "Oral Surgery in General Practice"
Reed O. Dingman....Ann Arbor, Mich.
10:30 "Emergency Treatment of Maxillofacial Injuries"
Sanford M. Moose..San Francisco, Calif.
11:30 "Local Anesthesia Simplified and Its Relation to Dental Surgery"
John Jacob Posner....New York, N. Y.

ORTHODONTICS

(Mechanics' Building, Room G)

9:30 a.m. to 12:00 m.

9:30
10:15 "Influence of Orthodontic Procedure upon the Development of the Jaws"
Carl Breitner.....New York, N. Y.
11:00 "Variations in the Timing of Orthodontic Treatment"
George R. Moore.....Ann Arbor, Mich.

PERIODONTIA

(Mechanics' Building, Room D)

9:30 a.m. to 12:00 m.

9:30 "Etiology and Treatment of Vincent's Infection"
Saul Schluger.....Jersey City, N. J.
10:15 "Clinical Oral Manifestations of Vitamin B Complex Deficiencies"
Arvin W. Mann.....Cleveland, Ohio
11:00 "Occlusal Reconstruction"
H. D. Grubb.....Cleveland, Ohio

DENTISTRY FOR CHILDREN AND ORAL HYGIENE

(Mechanics' Building, Room A)

9:30 a.m. to 12:00 m.

9:30 "Economic Success in the Practice of Dentistry for Children"
Charles A. Sweet.....Oakland, Calif.
10:15 "Requirements of an Effective Dental Health Education Program"
Vern D. Irwin.....Minneapolis, Minn.
11:00 "Protecting the Pulp in Deciduous and Young Permanent Teeth"
Eugene J. North.....Buffalo, N. Y.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Mechanics' Building, Room F)

9:30 a.m. to 12:00 m.

9:30 "Diagnosis and Treatment of Oral Neuralgic Pains"
Myer D. Wolfsohn.....Buffalo, N. Y.
10:15 "Shortcomings in the Nutrient Balance in Caries; Recommended Corrections"
Francis Krasnow.....New York, N. Y.
11:00 "Technic for the Rapid Evaluation and Correction of Diets"
Michael J. Walsh.....San Diego, Calif.

WEDNESDAY AFTERNOON AUGUST 26

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Mechanics' Building, Room B)

2:30 to 5:00 p.m.

Symposium: Restorative Materials
George M. Hollenback, Chairman....
.....Los Angeles, Calif.
2:30 "Porcelain"
E. Bruce Clark.....Pittsburgh, Pa.
"Cements"
E. W. Skinner.....Chicago, Ill.
3:15 "Gold Foil"
A. F. Romnes.....Chicago, Ill.
"Casting Materials"
W. H. Crawford.....Indianapolis, Ind.
4:00 "Acrylics"
Stanley D. Tylman.....Chicago, Ill.
"Amalgam"
George M. Hollenback.....
.....Los Angeles, Calif.

FULL DENTURE PROSTHESIS

(Mechanics' Building, Room E)

2:30 to 5:00 p.m.

2:30 "Thoughts in Making an Immediate Denture" (Illustrated with slides and motion pictures)
Alfred W. Simonson..Minneapolis, Minn.
3:15 "Servicing Complete Dentures to Secure and Maintain Adequate Function"
S. G. Applegate.....Detroit, Mich.
4:00 "How to Incorporate Jaw Movements in the Finished Dentures"
C. J. Stansbery.....Seattle, Wash.

PARTIAL DENTURE PROSTHESIS

(Mechanics' Building, Room H)

2:30 to 5:00 p.m.

2:30 "Mechanics and Physics Involved in Serviceable Porcelain Jacket Crown Restorations"
Loren D. Sayre.....Chicago, Ill.
3:15 "Practical Application of Generally Accepted Definition of Crown and Bridge Restorative Work"
Robert P. Dressel.....Cleveland, Ohio
4:00 "Questions and Answers on Fixed Crown and Bridgework"
Ralph C. Cooley, captain and interlocutor .....Houston, Texas

Respondents

Willard F. Andes.....Miami, Fla.
E. Bruce Clark.....Pittsburgh, Pa.
John S. Dohan.....Montreal, Canada
W. I. Ferrier.....Seattle, Wash.
H. D. Grubb.....Cleveland, Ohio
George M. Hollenback.....
.....Los Angeles, Calif.
Karl W. Knapp.....New York, N. Y.
W. A. Squires.....New York, N. Y.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Mechanics' Building, Room C)

2:00 to 4:45 p.m.

2:00 "Anatomic Considerations in Local Anesthesia"
Walter O. Phillips.....Detroit, Mich.
2:45 "Management of Infections Following Tooth Extraction"
James R. Cameron....Philadelphia, Pa.
3:45 "Surgery for Immediate Dentures"
Menifee Howard.....Denver, Colo.

ORTHODONTICS

(Mechanics' Building, Room G)

2:30 to 5:00 p.m.

2:30 Symposium on Treatment
George M. Anderson....Baltimore, Md.
3:15 Alfred P. Rogers.....Boston, Mass.
4:00 Robert H. W. Strang.....
.....Bridgeport, Conn.

PERIODONTIA

(Mechanics' Building, Room D)

2:30 to 5:00 p.m.

2:30 "Health Conservation of the Periodontal Tissue by a Method of Functional Partial Denture Design"
Ferdinand G. Neurohr..New York, N. Y.
3:15 "Treatment of Periodontal Disease for the General Practitioner"
Walter Leabo.....Shreveport, La.
4:00 "Why Leave the Rest of Their Life to Chance?"
Fred D. Miller.....Altoona, Pa.

DENTISTRY FOR CHILDREN AND ORAL HYGIENE

(Mechanics' Building, Room A)

2:30 to 5:00 p.m.

2:30 "Dental Treatment Programs for Children—Realism Applied"
J. M. Wisan.....Trenton, N. J.
3:15 "Relationship of Operative Dentistry to the Developing Jaws of Growing Children"
Paul K. Losch.....Boston, Mass.
4:00 "You Who Operate on Children"
Walter C. McBride.....Detroit, Mich.
4:25 "Effect of Ammoniacal Silver Nitrate on Caries in the First Permanent Molar"
Henry Klein.....Bethesda, Md.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Mechanics' Building, Room F)

2:30 to 5:00 p.m.

2:30 Round table discussion:
"Acrylic Resins; Their Physical and Chemical Properties and Their Clinical Applications"
George C. Paffenbarger..Brooklyn, N. Y.
Stanley D. Tylman.....Chicago, Ill.
Eugene W. Skinner (Ph.D.).Chicago, Ill.
William T. Sweeney (B.S.).....
.....Pittsburgh, Pa.
A. Alfred Nelson.....Royal Oak, Mich.

THURSDAY MORNING

AUGUST 27

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Mechanics' Building, Room B)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
Symposium:
"Interceptive Dentistry"
Carl R. Oman, Chairman.....
.....New York, N. Y.
"Prophylactic Treatment and Treatment Planning"
L. W. Thom.....Minneapolis, Minn.
10:15 "Prophylactic Odontotomy"
Benjamin Mahler.....Jersey City, N. J.
"Silver Nitrate in Caries Prevention, also Protective Metamorphosis of the Dentin"
B. O. Thomas.....New York, N. Y.
11:00 "Treatment of Initial Carious Lesions"
Carl R. Oman.....New York, N. Y.
Adjournment

FULL DENTURE PROSTHESIS

(Mechanics' Building, Room E)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Use of Acrylic Resins in the Construction of Dental Prostheses"
Russell W. Tench.....New York, N. Y.
11:00 "Present Status of Denture Base Materials"
E. W. Skinner (Ph.D.).....Chicago, Ill.
Adjournment

PARTIAL DENTURE PROSTHESIS

(Mechanics' Building, Room H)

9:30 to 12:00 m.

9:30 Business session and election of officers.
10:15 "Simplified Broken Stress in Partial Denture Prosthesis"
L. Glenn Cody.....Denver, Colo.
11:00 "Functional Factors and Fundamentals in Planning and Treatment for Bite Raising"
Harry Kazis.....Boston, Mass.
Adjournment

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Mechanics' Building, Room C)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Oral Surgery in Kodachrome"
Kurt H. Thoma.....Boston, Mass.
10:15 "Elimination of Postoperative Complications in Oral Surgery"
Leonard S. Morvay.....Newark, N. J.
11:00 "Complications During and Following Nitrous Oxide-Oxygen Anesthesia; Cause and Treatment"
Harry M. Seldin.....New York, N. Y.
Adjournment

ORTHODONTICS

(Mechanics' Building, Room G)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Orthodontics; Its Possibilities in Maxillofacial Restorations in War Injuries"
Leigh C. Fairbank...Washington, D. C.
10:15 "Future of Orthodontia in Public Health"
Walter J. Pelton.....Washington, D. C.
11:00 "What I Should Like to Know About Orthodontics"
Edward J. Ryan.....Evanston, Ill.
Adjournment

PERIODONTIA

(Mechanics' Building, Room D)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Grenz Rays in Their Application to Periodontal Disease"
Ralph H. Brodsky.....New York, N. Y.
10:15 "The Formation of Salivary Calculus"
Benjamin Tenenbaum...Brooklyn, N. Y.
11:00 "Chemicotherapy and Physiotherapy as Adjuncts in Conservative Treatment"
J. Lewis Blass.....New York, N. Y.
Adjournment

DENTISTRY FOR CHILDREN AND ORAL HYGIENE

(Mechanics' Building, Room A)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Esthetic Restoration of Fractured Anterior Teeth"
Howard H. Burkart.....Atlanta, Ga.
10:15 "Rendering Public Account in Dentistry"
John W. Knutson....Minneapolis, Minn.
11:00 "Dental Caries and the Metabolism of Calcium"
Hamilton B. G. Robinson..St. Louis, Mo.
Adjournment

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Mechanics' Building, Room F)

9:30 a.m. to 12:00 m.

9:30 Business session and election of officers.
"Use of Fluorides in Caries Prophylaxis"
Basil G. Bibby.....Boston, Mass.
10:15 "Histologic Analysis of Bone Changes in the Jaws in Paget's Disease"
Irving Glickman.....Boston, Mass.
11:00 "Nutrient Channels"
A. P. Sweet.....Rochester, N. Y.
Adjournment

GENERAL CLINIC PROGRAM

THURSDAY AFTERNOON AND FRIDAY, AUGUST 27-28

SECTION CLINICS

Periodontia

"Controlled Use of an Abrasive in Occlusal Surface Adjustment"
J. Lewis Blass.....New York, N. Y.

Orthodontics

"Some Results of and Procedures in Cases Treated According to the Principles of Charles H. Tweed"
Josephine M. Abelson...New York, N. Y.
Bercu Fisher .....New York, N. Y.
Arthur V. Greenstein...New York, N. Y.
Murray Peter Breidt.....Paterson, N. J.
Abraham Lubowitz ....Philadelphia, Pa.

Sidney E. Riesner.....New York, N. Y.
Arthur L. Fern.....Hartford, Conn.
William C. Keller.....New York, N. Y.
Glenn H. Whitson.....Brooklyn, N. Y.
Otto J. Sorenson.....New York, N. Y.
William R. Joule.....Kearney, N. J.
Harry L. Bull.....Jersey City, N. J.
Robert H. W. Strang..Bridgeport, Conn.
F. Copeland Sheldon...Kansas City, Mo.

GROUP CLINICS

Columbia University, Division of Orthodontics
Leuman M. Waugh, Director

"Demonstration of Twin Wire Appliances"
Joseph E. Johnson.....Louisville, Ky.
Joseph D. Eby.....New York, N. Y.
Lowrie J. Porter.....New York, N. Y.
Henry U. Barber.....New York, N. Y.
C. K. Madden.....Greenwich, Conn.

"Exercisers Used in the Treatment of Bilateral Ankylosis"
Arthur C. Totten.....New York, N. Y.

"Gnathostatic Diagnosis"
H. A. Galton.....New York, N. Y.
Donald B. Waugh.....New York, N. Y.

"Postgraduate Orthodontic Technic"
James Jay .....New York, N. Y.

"Simple Treatment"
George S. Calloway....New York, N. Y.

"Treatment of Crossbite in Deciduous Dentition"
J. A. Salzmann.....New York, N. Y.

INDIVIDUAL AND GROUP CLINICS

Southern California

"Orthodontics"
Joel Margaretten.....Los Angeles, Calif.

Illinois

"Indirect Inlay, Multiple Inlays, Bridge Abutments and Bridge Impressions in One Impression with Precision Accuracy"
Daniel D. Klein.....Chicago, Ill.

Indiana

"Treatment Dentures"
V. O. Snowden.....Gary, Ind.

"Use of Ethyl Chloride in Analgesia and Anesthesia; also Somnoform"
F. G. Davis.....North Judson, Ind.

"Non-Liquid Acrylic Dentures"
S. L. Border.....Monon, Ind.

"Permanent Liner for Artificial Dentures"
A. P. Craig.....Gary, Ind.

"Treatment of Hemophilia and Postoperative Hemorrhage"
D. C. Barnhill.....Indianapolis, Ind.

Kentucky

"Synthetic Porcelain"
Audrey F. Ellington.....Morehead, Ky.

"Helpful Hints"
C. P. Mayhall.....Harlan, Ky.

"Acrylics for Crown, Inlay and Bridgework"
J. Irwin Essig.....Louisville, Ky.

"Use of Hydrocolloids and a Compound in Crown, Bridge and Inlay Impressions"
Louis Ringol.....Louisville, Ky.

"Fracture Reduction Technic of Face and Jaw"
C. F. Mouser.....Evarts, Ky.

"Impressions for Immediate Dentures"
Russell I. Todd.....Richmond, Ky.

Maryland

"Leaded Resinous Radium Applicators in the Treatment of Oral Neoplasms"
Grant E. Ward (M.D.)...Baltimore, Md.
James E. Pyott.....Baltimore, Md.

"Complete Fixation of the Abutment Teeth in Stationary Bridgework"
Henry E. Rostov.....Baltimore, Md.

"Simplified Technic of Oral Roentgenology"
B. A. Dabrowski.....Baltimore, Md.

Michigan

"Plastics—Their Place in Prosthetics"
E. McClure Patterson....Detroit, Mich.

"Immediate Lower Denture Service"
Bernard D. Lynn.....Detroit, Mich.

"Operative Procedures for Children"
Henry M. Wilbur.....Detroit, Mich.

"Local Anesthesia"
Walter H. S. Phillips.....Detroit, Mich.

"Root Resection and Minor Oral Surgery for Children"
H. A. Maxman.....Detroit, Mich.

"Treatment of the Child's Fractured Anterior Teeth"
Samuel Stulberg.....Detroit, Mich.

"Practical Operative Dentistry for Children"
Alfred E. Seyler.....Detroit, Mich.

"Electric-Controlled Heaters for Hydrocolloid"
Roy Wells Fonda.....Detroit, Mich.

"Making Children's Dentistry Practical and Profitable"
Stanley C. Brown.....Ithaca, Mich.

Minnesota

"The Facebow in Its Relation to Accurate Balanced and Functional Occlusion in Prosthetic Dentistry"
F. S. Meyer.....Minneapolis, Minn.
F. C. Brown.....St. Paul, Minn.

"Mechanically Condensed Amalgam"
H. O. Westerdahl...Minneapolis, Minn.

"Opening of Bite by Means of Operative Dentistry"
C. Vernon Hultgren.Minneapolis, Minn.

"Diagnosis: New Developments in Roentgenography; the Dental Antrum an Index of Dental Disease"
Edmund F. Lieb....Minneapolis, Minn.

"X-Ray Films of the Temporomandibular Articulation"
W. W. McQueen....Minneapolis, Minn.

Missouri

"Treatment of Various Types of Maxillary and Mandibular Fractures"
Leo F. Marré.....St. Louis, Mo.

"Impressions for Full Lower Dentures"
J. W. Templeton.....St. Louis, Mo.

Nebraska

"Fractured Jaws"
R. J. Yechout.....Omaha, Nebr.

"All Wire Removable Appliance"
W. E. Stoft.....Omaha, Nebr.

"Orthodontia"
Arlo M. Dunn.....Omaha, Nebr.

New Jersey

"Periodontia"
Leslie J. Fitzsimmons..East Orange, N. J.

"Periodontia"
Isadore Weinmann .....Newark, N. J.

"Crown and Bridge Work"
Irving Sofferman.....Newark, N. J.

"Root Canal Therapy"
Maurice A. Dolowit.....Newark, N. J.

"Gold Foil"
Herbert E. Williams.....Red Bank, N. J.

"Preliminary Impressions for Full Dentures"
Nathan Epstein .....Asbury Park, N. J.

"Oral Surgical Procedures" (Motion pictures)
A. A. Ackerman.....Newark, N. J.
Harry J. Field.....Newark, N. J.

"Simplification in Full Upper and Lower Denture Construction"
Saul M. Gale.....Newark, N. J.

"Use of Silver Nitrate"
George C. Cleary.....Elizabeth, N. J.

New York

"Practical Suggestions in Inlay Construction"
H. Barishman .....Brooklyn, N. Y.

"A Dozen Don't's in Pulp Canal Therapy"
E. Alan Lieben.....New York,N. Y.

"Treatment of Obscure Headaches and Neuralgia, also One Case of Tic Douloureux" (With models)
Ervin S. Ulsaver....New Rochelle, N. Y.

"Simplified Indirect Inlay Technic"
William Diamond .....New York, N. Y.

"Inlay Wax Manipulation"
A. B. Riffle.....Rochester, N. Y.

"Concepts of Roentgenography"
Ralph S. Voorhees, Jr...Rochester, N. Y.

"Equilibration of Occlusion in Periodontal Treatment"
Allan N. Arvins.....New York, N. Y.

"Fractures of the Jaws and Facial Bones"
Harry L. Bisnoff.....Jamaica, N. Y.

"Fixed Acrylic Bridgework"
S. G. Nicholson.....New York, N. Y.

"Surgery for Immediate Dentures"
Hyman Weisberg .....Rochester, N. Y.

"Full Lower Dentures: Impression Making"
Zachary Blum .....New York, N. Y.

"Practical Procedure for the Conservation of Deciduous Teeth"
J. Z. Strum.....Brooklyn, N. Y.

"Diagnosis, Prognosis and Treatment of Cancer of the Mouth"
H. S. Rasi.....Brooklyn, N. Y.

North Carolina

"Simplified Method to Remove Stains from Mottled Enamel"
Wade H. Breeland.....Belmont, N. C.

"Simplified Method of Carving Acrylic Crowns and Bridges"
W. B. Sherrod....Winston-Salem, N. C.

"Nutritional Experiment with Vitamin B"
A. C. Early.....Aulander, N. C.

"Photography in Dentistry"
Olin W. Owen.....Charlotte, N. C.

"Improved Simplified Technic in Prosthodontia"
E. G. Clicks.....Elkin, N. C.
L. G. Coble.....Greensboro, N. C.

"Acrylic Resin Inlays, Jacket Crowns and Bridges"
A. C. Current.....Gastonia, N. C.

Ohio

"Use of Diamond Points for Jacket Preparations"
Joseph D. Gage.....Cleveland, Ohio

"Self-Administered Analgesia, Using Ethyl Chloride"
S. A. Forman.....Cleveland, Ohio

"Application of the Rubber Dam in One Minute or Less"
Joseph P. Schock.....Painesville, Ohio

Pennsylvania

"Preparation of a Pinledge and All Its Details"
A. Samuel Feldman....Philadelphia, Pa.

"Aids in Prevention of Dental Disease"
F. B. Gardner.....Scranton, Pa.

"Pedodontia"
Xen Kakouros .....Erie, Pa.

"Inlays Simplified"
Israel Harrison .....Bryn Mawr, Pa.

"Pathology of Children's Teeth"
Joseph L. Polk.....Pittsburgh, Pa.

American Dental Assistants Association

Alabama

"Helpful Hints"

"Sterilization"—Alabama Dental Assistants Association

California

"Mixing Amalgam"—Northern California Dental Assistants Association

"Dental Priority Problems"—Southern California Dental Assistants Association

District of Columbia

"If You Were the Patient"—District of Columbia Dental Assistants Society

Florida

"Speed in Forming Study Models"—Florida Dental Assistants Association

Georgia

"Cold Sterilization"—Georgia Dental Assistants Association

Indiana

"Making Individual Metal Impression Trays"

"Making Acrylic Dentures"—Indiana State Association of Dental Assistants

Iowa

"Saving Dental Scrap for Defense"

"Acrylics in Denture Work"

"Copper Plating Impressions for Dies"—Iowa State Dental Assistants Association

Maryland

"The Dental Assistant in Oral Surgery"—Baltimore Dental Assistants Society

Massachusetts

"Care and Sterilization of Burs"

"Assistance in Orthodontia"

"Study Casts and Pouring Models"

"Acrylics"—Massachusetts' Dental Assistants Association

Minnesota

"Expense Conservation in the Dental Office"—Minnesota Dental Hygienists and Assistants Association

Nebraska

"Helpful Hints"

"Helpful Hints for the Assistant"—Nebraska Dental Assistants Association

New Jersey

"Sterilization"—New Jersey Dental Assistants Association

New York

"Aids for the Assistant"—Dental Assistants Association of the State of New York

Pennsylvania

"Proper Care of the Handpiece"—Philadelphia Association of Dental Assistants

"The Assistant and the Child Patient"—Pittsburgh Dental Assistants Association

Tennessee

"Synthetic Porcelain"—Tennessee Dental Assistants Association

Wisconsin

"Models: Eruption of the Permanent Teeth and Nutrition"—Wisconsin State Dental Assistants Association

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NEW ENGLAND DAY CLINICS

"Early Orthodontic Treatment"
Raymond L. Webster..Providence, R. I.

"Despondency and Dental Caries"
E. F. Briggs.....Bangor, Maine

"Bridgework"
Harmon Shohet .....Boston, Mass.

"Dental Health Through Visual Education"
Oscar L. Perrault.....Hudson, Mass.

"Full Dentures—Various Phases and Technic in Construction"
W. C. Jennys.....Madison, Maine

"Modified Form of Lower Denture Stabilization"
Ira W. Stockwell.....Portland, Maine

"Acrylics in Dentistry"
Perley J. Lessard.....Portland, Maine

"Acrylic Crown and Bridge Restoration from Preparation to Mouth; for the Average Dentist by an Average Dentist"
Herbert A. Lichtenstein..Bangor, Maine

"Silicates, Their Use and Abuse" (With models)
John G. Perman.....Worcester, Mass.

"Alveoloplasty of Maxilla"
Symon C. Polansky.....Salem, Mass.

"Preparation and Logical Step Sequence of Filling Indicated Cavities with Cohesive Gold Foil"
Philip John Pinel.....Boston, Mass.

"Simplified Immediate Denture Technic"
Maurice A. Denby.....Warren, R. I.

"Practical Orthodontics"
Wilbur D. Johnston..New Haven, Cann.

"Mucostatic Impressions, a New Method and a New Idea Which Make It Possible to Anticipate Results"
Norman H. Fortier.....Pawtucket, R. I.

"Copper Plated Dies from an Electrolytic Wax Impression"
D. H. Clarridge.....Nashua, N. H.

"Practical Amalgam Technic"
Leon H. Jacobs.....Exeter, N. H.

"The Gold Inlay, Slice Preparation, Indirect Method"
S. Irving Copen.....Chelsea, Mass.

"Simpler Forms of Appliances Used in Orthodontic Treatment"
William J. Speers.....Boston, Mass.

"Some Interesting Cases in the Field of Oral Surgery"
Louis Gross.....Pittsfield, Mass.

"Treatment and Planning for Bite Raising"
Harry Kazis.....Boston, Mass.

"Fixed Bridge Assembly"
Norman W. Swett.....Boston, Mass.

"Local Anesthesia for Oral Surgery; Short Needle Technic and Land Marks for Insertion of Needle"
Charles B. Hopkins.....Boston, Mass.

"Selection of Teeth for Full Dentures with the Aid of the Photo-Flector"
Fred W. Richardson...Worcester, Mass.

"Direct Anterior Orthodontic Bands with Attachments"
Lewis H. Shipman.....Worcester, Mass.

"Acrylic Jacket Crowns on Malformed Teeth"
William L. Shipman...Worcester, Mass.

"Mouth Rehabilitation"
Edward L. Soares...New Bedford, Mass.

"Space Maintainers"
Fred Feingold.....Chelsea, Mass.

"Minor Oral Surgery for the General Practitioner"
Edwin T. Foster.....Springfield, Mass.

"Chrome Alloy in Orthodontia"
Albert F. MacDougal....Bangor, Maine

"Exodontia"
Wells A. Daniels.....Springfield, Mass.

"Various Phases of Exodontia"
Edmond A. Lebel.....Lewiston, Maine

"Treatment of a Periodontal Pocket"
Louis R. Forman.....Worcester, Mass.

"Ethyl Chloride Anesthesia for the Child"
Harry B. Shpiner.....Boston, Mass.

"Short Cuts to More Successful Construction of Dentures"
Julius Aisner.....Boston, Mass.

"Applied Economics"
Robert R. King.....Keene, N. H.

Joint Clinic

"Inherited Dentofacial Anomalies"
Morris R. Lebow.....Providence, R. I.
Paul B. Sawin.....Providence, R. I.

"Root Canal Therapy"
W. Vernon Ryder.....Boston, Mass.

"Analgesia"
J. A. Thibert.....Fitchburg, Mass.

"X-Ray Technic"
Edgar L. Abt.....Boston, Mass.

"Can Diet Help to Solve the Caries Problem?"
Charles H. Weymouth.Springfield, Mass.

"Complete Mouth Restoration Using Gold, Porzone, Porcelain Jackets and Acrylics"
Ilie Berger.....Providence, R. I.

"Facial Fractures"
William C. Hennigar..Greenwich, Conn.

"Periodontia—Simplified Diagnosis, Classification and Treatment"
A. Budner Lewis.....Providence, R. I.

"Application of Hydrocolloids to Inlay and Bridge Technic"
Charles I. Taggart.....Burlington, Vt.

"Dental Splints"
Levon K. Daghlian.....Boston, Mass.

"Edgewise Arch Mechanism"
Donald D. Osborn.....Providence, R. I.

"Immediate Denture Service—Questions and Answers"
John C. Stanton.....Danvers, Mass.

"Good Silicate Restorations"
Harry H. Sandler.....Revere, Mass.

"Occlusoscope"
Walter J. Sly.....Boston, Mass.

"Extension of Lower Dentures Below Mylohyoid Ridge for Retention"
William H. Newton....Worcester, Mass.

"Direct Three-Quarter and Pinledge Preparation; Wax Pattern Technic"
Arno M. Bommer.....Revere, Mass.

"Treatment of Infected Single Rooted Teeth"
Barnard Sagall.....Revere, Mass.

"Burnished Gold Foil Filling"
Horace L. Gould.....Bucksport, Maine

"Amalgam and Inlay Preparations"
Allyn F. Sullivan.....Providence, R. I.

"Preventive Orthodontia"
S. S. Greenberg.....Bridgeport, Conn.

"Auxiliary Springs in Labiolingual Arch Technic"
Emory H. Farrington.....Boston, Mass.

"Auxiliary Springs"
George N. Abbott....Newtonville, Mass.

"Alteration of Facial Appearance by Minor Surgery and Prosthetics"
Robert E. Morrow.....Lynn, Mass.

"Simple and Practical Way to Construct Dentures"
G. H. Anderson.....Cranston, R. I.

"Apicoectomy"
Phillip M. Chernoff..Middletown, Conn.

"A Suggested Surgical Prophylaxis for the Lower Third Molars of Youth"
William G. Jewett.....Gardner, Mass.

"Cavity Preparations for Deciduous Teeth"
Maxwell Sherman.....Hingham, Mass.

"Early Symptoms and Treatment of Periodontal Diseases"
Bernard S. Chaikin.....Boston, Mass.

"Dental Plaster of Paris: Expansion, Contraction and Crystallography; Technic of Manipulation"
Edward L. Bishop....East Boston, Mass.

"Full Dentures"
Kenneth C. Johnson.New London, Conn.

"Root Canal Instruments and Sterile Technic for the General Practitioner"
Maurice E. Peters, Jr.....Boston, Mass.

"Orthodontics"
J. Wilson Harthorne....Portland, Maine

"An Approach to Root Therapy with Principles of Surgery as a Basis"
Alex Weinberg.....Providence, R. I.

"Things a Dentist Can Make to Save $100"
Normand Jean Paquette.Lewiston, Maine

"Transparent Enamel Porcelain Jacket Crown"
Frederick W. Hovestad....Boston, Mass.

"Visual Education"
Gordon A. Conboy.....Keene, N. H.

"Immediate Dentures"
Byron W. Bailey.....Bradford, Vt.

"Dental Occlusion in Patients with Muscular Dystrophy"
John C. Brown.....Andover, Mass.

"Use of Chrome Alloy in Orthodontia"
Henry C. Beebe.....Boston, Mass.

"Practical Gold Inlays"
Paul R. Smith.....Lewiston, Maine

GROUP CLINICS

Boston City Hospital Clinic
Stephen P. Mallett, Director

"Osteomyelitis"
Thomas Hennessy.....Boston, Mass.

"First Aid and First Aid Kit for Syncopy Collapse"
George F. Winchester.....Boston, Mass.
Raymond D. Jones.....Revere, Mass.

"Elevator Technic"
Austin Thomas Williams...Salem, Mass.

"Materials and Methods of Suturing"
Herbert Ludwig Esterberg.Newton, Mass.

"Dilantin"
Philip H. White.....Boston, Mass.

"Immediate Dentures"
John W. Kaup.....Boston, Mass.
Kenneth Starbird .....Belmont, Mass.

"Cancer"
Harold H. Hookway.....Boston, Mass.

"Inhalation Anesthesia and Analgesia"
Frank M. McLean.....Boston, Mass.

"Inhalation Anesthesia"
Philip J. Sheridan.....Hartford, Cann.

"Sterile Procedure"
William F. Cleary.....Boston, Mass.

"Sterile Procedures"
Francis C. Ortolani.....Boston, Mass.

"Fractures of the Jaws"
Joseph B. Barron.....Boston, Mass.
John T. Kelleher.....Springfield, Mass.

"Zinc Peroxide in Vincent's Infection and Other Infections of the Mouth"
Walter C. Guralnick.....Boston, Mass.

"Pentothal Sodium Anesthesia"
Burns Foley.....Northampton, Mass.

"X-Rays"
E. A. Kinley, Jr.....Boston, Mass.

"Treated Cases Showing Labiolingual Technic"
Paul J. McKenna.....Springfield, Mass.

"Minor Oral Surgery for the Dentist in General Practice"
Ralph D. Thompson.....
.....Newton Highlands, Mass.

Joint Clinic

"Fundamental Principles Basic to Functional Full Denture Construction"
J. B. Montano.....New Haven, Conn.
H. Beecher Costa....New Haven, Conn.

"Alveolectomy for Better Denture Prosthesis"
Walter V. MacGilvra..Worcester, Mass.

"Some Uses of Ammoniacal Silver Nitrate in General Practice of Dentistry"
Melvin P. Wade.....Hudson, Mass.

"Hydrocolloid Technic for Partial Impressions"
Edward Bollinger .....Worcester, Mass.

"Molar and Premolar Three-Quarter Veneer Crowns"
Roger J. Edwards.....Danvers, Mass.

"Preextraction Records as an Aid in Full Denture Construction"
Hubert C. Fortmiller.....Boston, Mass.

"Osteomyelitis"
George D. Bissell.....Melrose, Mass.

"Vincent's Infection; Obtaining and Staining Smears"
Robert M. Furfey.....Cambridge, Mass.

"X-Rays in Children's Dentistry as an Aid in Diagnosis and Prognosis"
John E. Tyler.....Worcester, Mass.

"Manipulation of the Edgewise Mechanism"
I. D. Davis.....Boston, Mass.

"Practical Amalgam Technic"
Ernest A. Elliott.....Portland, Maine

"Direct-Indirect Inlay Technic"
Claude A. Leonard....Providence, R. I.

"Oral Surgical Applications of Ticonium"
Alvin E. Strock.....Boston, Mass.

"Replacements for Missing Teeth—Fixed and Removable"
Lawrence M. Staples.....Boston, Mass.

"Malocclusion in the Deciduous Arch"
Harry W. Perkins.....Boston, Mass.

"Modified Black Preparation of Cavity and Packing of Amalgam with Pneumatic Condenser"
Samuel Edward Coen..Springfield, Mass.

"Diagnosis and Management of Vincent's Infection"
C. Truman Nelson.....Boston, Mass.

"General Management of Surgical Lesions of Face and Jaws"
George J. Fink.....Boston, Mass.

"Periodontal Instrumentation"
Abraham Daitch.....Boston, Mass.

"Prevention and Correction of Malocclusion for the General Practitioner"
Anderson S. Briggs.....Attleboro, Mass.

"Twin-Arch Mechanism"
Albert C. Holzman.....Boston, Mass.

"Restoration of Lower Posterior Teeth"
Charles H. Morton.....Waltham, Mass.

"Information on Diet for the General Practitioner"
Wendell G. Ahern.....Pittsfield, Mass.

GROUP CLINIC

Harvard Dental School
G. Earl Thompson, Director

"Root Canal Therapy with Bacteriologic Control"
Morton F. Yates.....Cambridge, Mass.
Fred W. Morse.....Boston, Mass.

"Compromise Orthodontic Treatment in Two Adult Cases"
Everett A. Tisdale.....Boston, Mass.

"Indication for Surgical Intervention Before Denture Prosthesis"
Peter R. MacKinnon...Wollaston, Mass.

"Roentgenographic Technic in Problem Cases"
Earle C. Cummings.....Boston, Mass.

"X-Ray Study of Caries"
Arnold D. Barton.....Boston, Mass.

"Practical Surgical Anatomy"
Edward Jacob Durling....Boston, Mass.

"Fundamentals in Fixed Partial Denture Prosthesis"
Joseph P. Jazowski.....Quincy, Mass.

"Gold Inlays for Deciduous Teeth"
Philip J. Gauthier.....Portland, Maine

"Acrylics in Restorative Dentistry"
Robert Shaw Wesson.....Boston, Mass.

"Root Canal Therapy"
Joseph A. Ahern.....Boston, Mass.

"Use of the Amalgamator in Gold Foil and Mat Gold Fillings"
Norman F. Johnson.....Rutland, Vt.

"Better Understanding Between Dentist and Patient"
Ivor P. Muzzey.....Athol, Mass.

"Gold Inlays"
Robert C. Lonergan.New London, Conn.

"Preparation Porcelain Jacket Crowns"
G. M. Teasdale.....New Bedford, Mass.

"Simplified Orthodontic Procedure for Correcting Mesial Drift of Molars"
Sidney P. Stone.....Dorchester, Mass.

"Electrosurgery and the Treatment of Periodontal Disease"
Lewis Fox.....South Norwalk, Conn.

"Restoration of Function and Space Maintenance in Cases Involving Tipped Teeth"
Charles E. Scribner.....Boston, Mass.

"Cephalometrics in Clinical Orthodontics"
Herbert I. Margolis.....Boston, Mass.

"Important Factors in Orthodontia"
George T. Baker.....Boston, Mass.

"Hollow Gold Inlays"
Alexander Goldenberg....Boston, Mass.

"Some Advantages of the Use of the Edgewise Arch Technic"
Harold J. Nice.....Boston, Mass.

GROUP CLINIC

Tufts Dental School

"Acrylics in Dental Practice"
L. Walter Brown.....Boston, Mass.

"Three-Quarter Crown Preparation and Bridge Attachment"
Michael A. Novia.....Worcester, Mass.

"Gold Foil"
Martin J. Daley.....Belmont, Mass.

"Amalgam Technic"
Michael S. Bales.....Boston, Mass.

"X-Ray Technic and Interpretation"
Frederick W. Lake.....Boston, Mass.

"Root Canal Technic"
Bernard Berg.....Boston, Mass.

"Diagnostic Procedures"
Arthur H. Wuehrmann..Arlington, Mass.

"Oral Bacteriology"
B. G. Bibby.....Boston, Mass.
Irene McKinnon, Assistant.Boston, Mass.

"Developmental Anomalies of Face and Palate" (Motion picture)
Benjamin Spector (M.D.).Boston, Mass.

"Management of Space Created by the Accidental Loss of Incisor"
Arthur L. Morse.....Boston, Mass.

"Applied Dental Therapeutics"
Arthur T. Palmer.....Lynn, Mass.

GROUP CLINIC

Tufts Dental School Undergraduate Group

L. Walter Brown, Jr., Director

"An Exhibition of Student Work from the Preclinical Technic Department"
F. J. Bacewicz.....Boston, Mass.
E. G. Brainerd.....Boston, Mass.
E. J. Noonan, Jr.....Boston, Mass.
J. L. Dilibero.....Boston, Mass.
O. C. Sicard.....Boston, Mass.
A. R. Lagerstedt.....Boston, Mass.
D. T. Spore.....Boston, Mass.
R. L. Thibodeau.....Boston, Mass.

"Periapical Curettage and Root Amputation"
George N. Noss.....Boston, Mass.

"Roentgenograms Showing Importance in Diagnosis and Prognosis"
Rupert S. Lovejoy.....Portland, Maine

"Acrylics in Operative Dentistry"
Edward R. Loftus.....Quincy, Mass.

"Common Faults in the Use of Amalgam"
Edwin A. Sturgis....Marblehead, Mass.

"Anesthesia and Exodontia Problems of Interest to the General Practitioner"
William A. Nesbit, Jr.....
.....New Haven, Conn.

Joint Clinic

Harvard School of Public Health and Forsyth Dental Infirmary

"Study in Development of Occlusion" (With models, charts and x-ray films)
Frederick C. Allen.....Boston, Mass.

"Surface Extension of Caries in Children" (With charts, models and x-ray films)
Philip Williams.....Boston, Mass.

"Showing the Dental Patient Why"
M. Michael Cohen.....Boston, Mass.
Beatrice A. Lapidus, Hygienist.....
.....Boston, Mass.

"Stabilizing Molar Anchorage in Orthodontic Treatment"
Benjamin Edward Bahn...Boston, Mass.

THE BOSTON MEETING

RADIO PROGRAM

The Public Relations Committee has been able to secure time on radio stations WBZ-WBZA; WORL-WCOP; WEEI and WNAC.

LUNCHEON CLUB PROGRAM

Plans are under way to take complete charge of the programs for the Rotary and Kiwanis Clubs.

HAROLD H. HOOKWAY, *Chairman*,
Public Relations Committee.

WOMEN'S PROGRAM

Tuesday, August 25

9:30 a.m. Formal opening of the American Dental Association meeting in the Ballroom of the Hotel Statler.

1:00 p.m. Luncheon, with a style show, in the Ballroom of the Hotel Statler. Tickets should be secured early.

8:00 p.m. Second General Session of the American Dental Association, Ballroom, Hotel Statler.

Wednesday, August 26

9:00 a.m. The Ladies Committee will be in the Hotel Statler all day making arrangements for a sightseeing trip, book reviews or shopping tours. Registration should be made early for the type of entertainment preferred.

7:30 p.m. Dinner dance and floor show in honor of the President, Dr. Oren A. Oliver, in the Ballroom of the Hotel Statler.

Thursday, August 27

An interesting outing for the visiting wives is planned for this day by their Massachusetts hostesses.

7:30 p.m. The Entertainment Committee will provide an evening of entertainment.

GREETINGS

We are all delighted to know that you are coming to Boston. We hope that your trip will be a pleasant one and we shall be ready to greet you upon your arrival. We want to make your acquaintance and help you in any way you may wish.

Please do register immediately for the luncheon and trips as the number may be limited and we want as many of you as possible to participate in our entertainment.

At present, our plans are to guide you about our lovely city whether on shopping or sightseeing trips. A group will be ready to escort you or give you directions, whichever you prefer.

On Tuesday, we will have the Ladies Luncheon and Style Show. Do plan to come and get acquainted with us. Wednesday morning, we hope to have a short and interesting talk on the historical spots within walking distance, and there are many delightful and interesting ones, after which you may join a group and visit them. In the afternoon, we are planning a book review, which will give you an opportunity to rest a bit, and then we will start a walking trip again for any who are interested. *Please do bring your walking shoes!*

On Thursday, we are planning a trip to give you some real old "New England Atmosphere."

You realize, we are sure, our handicap, due to the present world conditions and priorities, but we will do our utmost to make your visit pleasant and happy. Hoping to greet you personally, we are,

MASSACHUSETTS LADIES COMMITTEE,
MRS. JOHN R. WALLACE, *Chairman.*

SCIENTIFIC AND HEALTH EXHIBITS

List of Exhibitors as of June 16, 1942

Dental Departments of State Boards of Health

Illinois Department of Public Health, Division of Dental Health and the Illinois State Dental Society, Springfield:
Mottled Enamel.

Kansas State Board of Health, Division of Dental Hygiene, Topeka:
Dental Health Education Week.

Massachusetts Department of Public Health, Boston:
Nutrition and Dentistry.

Virginia State Department of Health, Richmond:
Health Activities.

City Dental Programs

Board of Education (Abington Avenue School), Newark, N. J.:
Prevention Through Education—Newark Pupils Do Their Share.

Board of Education, City of New York. J. A. Salzmann:
Effect of First Molar Loss on Eruption,

Boston Health Department, Boston, Mass.

Palto Alto School Dental Clinic, Palo Alto, Calif.:
Palo Dental Health Program.

Schools

Ewing C. McBeath, College of Dental and Oral Surgery, Columbia University and Bion R. East, DeLamar Institute of Public Health, Columbia University, New York, N. Y.:
Clinical and Epidemiologic Studies of Dental Caries.

Harvard University Dental School, Boston, Mass.:
War Injuries of the Face and Jaws.

I. Schour and B. G. Sarnat, Department of Histology, College of Dentistry, University of Illinois, Chicago, Ill.:
Oral and Dental Disturbances of Occupational Origin.

L. F. Edwards and G. O. Graves, Ohio State University, Columbus, Ohio:
Stained Sections of Adult and Fetal Heads.

Irving Glickman, Department of Oral Pathology, Tufts Dental School, Boston, Mass.:
A Histologic Approach to Periodontal Disease.

Vilray Papin Blair, M.D., and L. T. Byars, M.D., Department of Surgery, Washington University School of Medicine, and Sherwood Moore, M.D., Edward Mallinckrodt Institute of Radiology, St. Louis, Mo.:

Adamantinomas and Other Central Tumors and Cysts of the Jaw Bones.

Washington University, School of Dentistry, St. Louis, Mo.:
The Interrelationship of Histology, Pathology and Anatomy with Roentgenography and Clinical Dentistry.

Organizations

American Dental Assistants Association:
The Dental Assistant in Relation to National Health.

American Dental Hygienists' Association:
The Dental Hygienist in the Development of the American Health Program.

American Dental Association, Bureau of Public Relations.

American Dental Association, Council on Dental Therapeutics and Bureau of Chemistry.

American Dental Association, Dental Preparedness Committee.

American Dental Association, Committee on Economics.

American Dental Association, Insurance Committee.

American Dental Association, Committee on Legislation.

American Dental Association, Dental Relief Fund Committee and Relief Commission.

American Dental Association, Research Commission and the National Bureau of Standards.

American Medical Association:
Dietary Deficiency Diseases.

American Pharmaceutical Association, Massachusetts State Pharmaceutical Association and the Massachusetts College of Pharmacy:
Dental Medication for Office and Patients' Use.

American Red Cross:
Nutrition Service.

American Social Hygiene Association:
The Attack on Commercialized Prostitution.

American Society for the Control of Cancer, Inc.:
Symptoms and Diagnosis of Cancer.

Peter Bent Brigham Hospital. M. S. Strock and A. E. Strock, Boston, Mass.:
Oral Manifestations of Disease.

Beth Israel Hospital. M. Michael Cohen and A. Rudy, M.D., Boston, Mass.:
Oral Aspects of Diabetes Mellitus.

Burroughs' Newsboys Foundation Health Clinic. Harry Goldinger, Brookline, Mass.

Children's Hospital, Department of Stomatology, Boston, Mass.:
Dental Findings in Children.

Cleveland Health Museum. Bruno Gebhard, M.D., Cleveland, Ohio:
Dental Lay Education in Nutrition.

Connecticut Dental Hygienists' Association:
Health and Vitamin Circus.

Eastman Dental Dispensary. Harvey J. Burkhart, Rochester, N. Y.:
Dental Clinics Founded by George Eastman.

Federación Odontológica, Buenos Aires, Argentina.

The Murry and Leonie Guggenheim Dental Clinic, New York, N. Y.:
Deciduous Tooth Embryology.

International Association for Dental Research:
Journal of Dental Research.

James B. Mann Study Club, Washington, D. C.:
Research Activities.

Massachusetts Dental Society, Dental Health Service Section:
Control Dentistry and Visual Education.

Massachusetts Nursing Council for War Service, Boston, Mass.:
Student Recruitment.

Montefiore Hospital, New York, N. Y.:
Dental Anomalies.

National Dental Hygiene Association and Boston Health League, Inc.:
Prehabilitation Not Rehabilitation.

Public Safety Committee, Boston, Mass.

St. Agnes Hospital. T. A. Hardgrove, Fond du Lac, Wis.:
Fungus Infections, Tumors, Osteomyelitis, Tic Douloureux and Lead Poisoning.

Selective Service System, Medical Division, National Headquarters, Washington, D. C.

U. S. Food and Drug Administration:
Enforcement of the Federal Food, Drug and Cosmetic Act.

U. S. Public Health Service:
Dental Care Versus Dental Caries.

U. S. Army Dental Corps and the Army Medical Museum:
Activities of the Army Dental Corps and the Army Medical Museum.

Individual Exhibitors

Alfred A. Ackerman and Harry J. Field, Newark, N. J.:
Automatic Mallet Technic in the Removal of the Impacted Lower Third Molar.

Paul J. Aufderheide, Cleveland, Ohio:
Oral Surgery.

Ralph Bowen, M. D., Houston, Texas:
The Allergic Child as Seen in Every Day Dentistry.

E. Benton Conaway, Columbus, Ohio:
Helpful Hints to the General Practitioner.

Earle C. Cummings, Boston, Mass.:
X-Ray Studies for Technical and Clinical Application.

Raeburn R. Davenport, Boston, Mass.:
Successful Psychologic Approach to Dentistry for Children.

Moses Joel Eisenberg, Roxbury, Mass.:
The Normal in Dental Tissues.

John J. Fitz-Gibbon, Holyoke, Mass.:
Cleft Palate Correction in All Its Phases.

Otho Leon Geyer, Grey Eagle, Minn.:
Visual Dental Education.

Conrad C. Gilkison, Camp Shelby, Miss.:
Cancer of the Face and Jaws.

Isador Hirschfeld, New York, N. Y.:
Oral Hygiene Implements on Parade.

Louis H. Jorstad, M.D., St. Louis, Mo.:
Neoplasms of the Oral Cavity.

Harry Kazis, Boston, Mass.:
Fundamentals of Bite Planning.

Joseph S. Landa, New York, N. Y.:
Full Denture Prosthesis as a Distinct Health Service.

A. Budner Lewis, Providence, R. I.:
The Dental Scene 200 B.C.-1942 A.D. (A Study in Bas-Relief).

Herbert I. Margolis, Boston, Mass.:
Cephalometrics in Orthodontia.

Fred D. Miller, Altoona, Pa.

Samuel Rabkin, Cincinnati, Ohio:
Variable Bone Formation as a Factor in Periodontal Disorder.

Sidney E. Riesner, New York, N. Y.:
Temporomandibular Photographic Serial in Opening Process.

Perley H. Roberts, Rochester, N. H.:
Preventive Orthodontia for the General Practitioner.

A. Porter S. Sweet, Rochester, N. Y.:
Various Radiodontic Technics.

Curt von Wedel, M.D., Oklahoma City, Okla.:
Double Harelip and Cleft Palate Operative Procedure.

Dorothy B. Waugh, Philadelphia, Pa.:
The Mechanism of Mastication.

VISUAL EDUCATION PROGRAM
(Motion Pictures)

Monday, August 24
10:00 a.m. to 12:00 m.

10:00 a.m. "Practical Procedures in Oral Surgery" (Kodachrome; approximate time, 30 minutes)
Samuel Granof.....Milwaukee, Wis.

10:30 a.m. "Local and Intravenous Anesthesia" (Kodachrome; approximate time, 30 minutes)
Edward Reiter.....Cleveland, Ohio

11:00 a.m. "Acrylic Resin in Crown and Bridge" (Kodachrome; approximate time, 40 minutes)
Saul Levy.....Scranton, Pa.

11:40 a.m. "Development and Physiologic Deepening of the Gingival Crevice" (Kodachrome; approximate time, 20 minutes)
Carl A. Schlack (Lt. Cmdr., U.S.N.)

Monday, August 24
2:00 to 4:00 p.m.

2:00 p.m. "Functional Occlusal Balance in Artificial Denture Construction" (Kodachrome; approximate time, 40 minutes)
Emmett Beckley.....St. Joseph, Mo.

2:40 p.m. "Problems in Tooth Preservation" (Kodachrome; approximate time, 20 minutes)
Samuel C. Miller and Herbert H. Kabnick .....New York City

3:00 p.m. "Practical Preventive Orthodontics" (Kodachrome; approximate time, 25 minutes)
Max J. Futterman.....New York, N. Y.

3:25 p.m. "Standardized Technic for Management of Pulpless Teeth" (Kodachrome; approximate time, 40 minutes)
Charles Ogur.....Brooklyn, N. Y.

Tuesday, August 25
10:00 a.m. to 12:00 m.

10:00 a.m. "Technic of Bite Raising" (Kodachrome; approximate time, 30 minutes)
Victor N. Jaffe.....Washington, D. C.

10:30 a.m. "Case of Periodontal Disease: Causes, Effects and Treatments Used" (Kodachrome; approximate time, 30 minutes)
Leslie J. Fitzsimmons..East Orange, N. J.

11:00 a.m. "Growth and Development of the Dentition" (Kodachrome; approximate time, 30 minutes)
Meyer Hoffman and David Gordon..
.....Brooklyn, N. Y.

11:30 a.m. "Root Canal Therapy and Technic" (Kodachrome; approximate time, 30 minutes)
G. P. Bannister.....Cleveland, Ohio

Thursday, August 27
2:00 to 4:00 p.m.

2:00 p.m. "Wax Impression Technic" (Kodachrome; approximate time, 30 minutes)
Henry B. Anderson.....Pittsburgh, Pa.

2:30 p.m. "Fractures of the Mandible and

Maxilla" (Kodachrome; approximate time, 30 minutes)
Glenn Major.....Pittsburgh, Pa.

3:00 p.m. "Acrylics" (Kodachrome; approximate time, 30 minutes)
Frank L. Hart.....San Francisco, Calif.

3:30 p.m. "Class III Gold Foil Restoration" (Kodachrome; approximate time, 30 minutes)
University of California.....
.....San Francisco, Calif.

ASSOCIATED GROUPS

THE AMERICAN ACADEMY OF PERIODONTOLOGY

The Twenty-Ninth Annual Meeting of the American Academy of Periodontology will be held in the Copley Plaza Hotel, Boston, August 20-22.

RAYMOND E. JOHNSON, *Secretary*,
824 Lowry Bldg.,
St. Paul, Minn.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The National Association of Dental Examiners will hold its annual meeting August 22-23, at the Hotel Statler, Boston.

R. P. Thomas,
Francis Building,
Louisville, Ky.

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

The American Society of Dentistry for Children will hold its sixteenth annual meeting August 22-25, at the Hotel Vendome, Boston.

R. M. ERWIN, JR., *Secretary*,
613 Corbett Bldg.,
Portland, Ore.

AMERICAN ASSOCIATION OF WOMEN DENTISTS

The American Association of Women Dentists will hold its twenty-first annual meeting in the Hotel Statler, Boston, August 24.

LAURA DEANE, *Secretary*.
Lowell, Mass.

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY

The American Academy of Restorative Dentistry will hold its annual meeting at the Copley-Plaza Hotel, Boston, August 22-23.

AMERICAN ASSOCIATION OF DENTAL EDITORS

The American Association of Dental Editors will hold its annual meeting in Room 419, Hotel Statler, Boston, August 24.

O. W. BRANDHORST, *Secretary*,
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

The American Association of Public Health Dentists will hold its annual meeting in the Vendome Hotel, Boston, August 23-25.

FLORENCE HOPKINS,
State House,
Boston, Mass.

AMERICAN FULL DENTURE SOCIETY

The American Full Denture Society will hold its fourteenth annual meeting in the Parker House, Boston, August 22-24.

JOHN R. WALLACE,
1 Mt. Vernon St.,
Boston, Mass.

ACADEMY OF DENTURE PROSTHETICS

The Academy of Denture Prosthetics will meet in the Hotel Statler, Boston, August 17-21.

R. J. NAGLE,
Harvard Dental School,
Boston, Mass.

ASSOCIATION OF MILITARY DENTAL SURGEONS

The Association of Military Dental Surgeons will hold its annual meeting at the Hotel Statler, Boston.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

The American Society of Oral Surgeons and Exodontists will meet in the Copley Plaza Hotel, Boston, August 20-22.

FRANK W. ROUNDS,
403 Commonwealth Ave.,
Boston, Mass.

AMERICAN COLLEGE OF DENTISTS

The American College of Dentists will meet in the Hotel Statler, Boston, August 23.

O. W. BRANDHORST,
4952 Maryland Ave.,
St. Louis, Mo.

INTERNATIONAL COLLEGE OF DENTISTS

The International College of Dentists will

hold its midyear convocation in the Hotel Statler, Boston, August 23, at 6:00 p.m.

ELMER S. BEST,
Medical Arts Building,
Minneapolis, Minn.

AMERICAN ACADEMY OF PLASTIC RESEARCH IN DENTISTRY

The American Academy of Plastic Research in Dentistry will meet in the Hotel Statler, Boston, August 23.

LAMAR W. HARRIS,
25 E. Washington St.,
Chicago, Ill.

A.D.A. HOUSE OF DELEGATES LUNCHEON

The House of Delegates Luncheon will be held August 24, in the Ballroom of the Hotel Statler. Delegates will be the guests of the mayor of the City of Boston, Maurice J. Tobin.

AMERICAN DENTAL ASSISTANTS ASSOCIATION

The American Dental Assistants Association will hold its eighteenth annual meeting in the Parker House, Boston, August 24-28.

SADIE HADLEY,
Beverly, Mass.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

The American Dental Hygienists' Association will hold its annual meeting in the Sheraton Hotel, Boston, August 24-28.

GLADYS FLINT,
106 Marlboro St.,
Boston, Mass.

NATIONAL DENTAL ALUMNI ASSOCIATION

The National Dental Alumni Association of the Baltimore College of Dental Surgery, Dental School of the University of Maryland, will hold a testimonial dinner in honor of J. Ben Robinson, President Elect of the American Dental Association, August 25, at the Hotel Statler, Boston.

LEONARD I. DAVIS, *President.*

HARVARD CLASS OF 1919

The Harvard Class of 1919 will hold a reunion dinner at the Harvard Club, Tuesday, August 25, at 6:00 p.m.

RUSSELL D. WASS,
475 Commonwealth Ave.,
Boston, Mass.

AMERICAN DENTAL GOLF ASSOCIATION

THE COUNTRY CLUB, BRAE BURN AND CHARLES RIVER

Three of the greatest golf clubs in the country invite the members of the American Dental Association to play during the Annual Meeting in Boston.

Among the outstanding events that have taken place at these clubs are listed the following:

At the Country Club, the Amateur Tournament has been played three times, the Open once and the Women's Amateur only last year; also the International Walker Cup matches.

Brae Burn has had the Open Tournament; and it is here that Bobby Jones won the Amateur Tournament in 1928.

Charles River, in addition to having held the state amateur tournament, has just recently had the Big Eight play there. This team includes such outstanding professionals as Nelson, Hogan, Sneed and Wood.

These are all beautiful, natural rolling courses with woods, brooks and ponds for natural hazards; nevertheless, they are all fair, and a straight, well-hit shot will always bring its reward. Bring your clubs and join us for one of the most enjoyable days you have ever had. These exclusive clubs are opening their doors just for us.

There will be many prizes and good ones.

COUNTRY CLUB — Class A
BRAE BURN — Class B
CHARLES RIVER — Class C

AMERICAN DENTAL TRAP SHOOTERS LEAGUE

The Trap Shooters League of the American Dental Association will hold its yearly shoot at Boston, August 24. Both shoots will be staged at the Massachusetts Fish and Game Club, Norfolk, Mass. For full particulars, address Frank McLean, 140 Federal St., Boston.

METROPOLITAN DENTAL SOCIETIES' OFFICERS CONFERENCE

There will be a meeting of the Metropolitan Dental Societies' Officers August 26, at 9:00 a.m. in Parlor B, Hotel Statler.

S. A. SCHMID, *Secretary.*

EXHIBIT MANAGERS

A meeting of the Exhibit Managers will be held in Parlor B, Hotel Statler, August 25, at 9:00 a.m.

PAN AMERICAN LUNCHEON

The Pan American Luncheon will be held August 25, 12:00 noon, in the Georgian Room, Hotel Statler.

PAST PRESIDENTS' LUNCHEON

The Past Presidents' Club of the American Dental Association will hold its annual luncheon at 12:30 p.m., August 25, Parlor C, Mezzanine Floor, Hotel Statler. The annual address will be delivered by Percy R. Howe, Boston.

HOMER C. BROWN, *Secretary,*
1816 Franklin St.,
Columbus, Ohio.

NEW YORK DELEGATES' BREAKFAST

The New York Delegates will hold their breakfast meeting in Parlor C, Mezzanine Floor, Hotel Statler, Boston, August 26, at 8:00 a.m.

A.D.A. MEMBERSHIP COMMITTEE

The Membership Committee of the American Dental Association will hold a breakfast meeting in Parlor C, Mezzanine Floor, Hotel Statler, Boston, Sunday, August 23, at 8:00 a.m.

PAUL W. ZILLMAN, *Chairman.*

SOUTHERN CALIFORNIA DELEGATES' BREAKFAST

The Southern California State Dental Association Delegates will have a breakfast meeting in Parlor F, Mezzanine Floor, Hotel Statler, August 24, at 8:00 o'clock.

W. STUART NEBLETT, *President.*

NATIONAL BOARD OF DENTAL EXAMINERS

The National Board of Dental Examiners will meet in Parlor D, Mezzanine Floor, Hotel Statler, August 23, at 4:00 o'clock.

MORTON J. LOEB, *Secretary.*

CONVOCATION AND BANQUET OF ST. APOLLONIA FEDERATED GUILDS OF CATHOLIC DENTISTS

The annual convocation and banquet of the Saint Apollonia Federated Guilds of Catholic Dentists will be held in Boston, August 23-24, with headquarters at the Puritan Hotel. August 23, the Guild members will attend Holy Mass at 9 o'clock at Saint Clement's Church, Back Bay. Rt. Rev. Monsignor Michael J. Splaine, spiritual director of the Boston Guild, will be the celebrant of the Mass, which will be a memorial service to the dentists who have made the supreme sacrifice in America's wars for democracy. On Monday evening, a banquet will be held at the Puritan Hotel. Reservations may be made by writing the secretary, Frederick R. McGrail, 107 Massachusetts Ave., Boston.

JOSEPH A. DOHERTY, *Chairman,*
Arrangements Committee.

FRATERNITIES

XI PSI PHI REUNION

The Annual Reunion of Xi Psi Phi Fraternity will be held August 24 in the Puritan Hotel, Boston. Reception at 6:30, dinner at 7:00. Ladies invited.

RALPH H. AIKEN, *Supreme President.*

DELTA SIGMA DELTA

The Delta Sigma Delta Fraternity will hold its annual meeting at the Copley Plaza Hotel, Boston, August 24.

RALPH LANCASTER,
60 Charles Gate W.,
Boston, Mass.

PSI OMEGA

The Psi Omega Fraternity will meet at the Parker House, Boston, August 24.

GLEN LAWRENCE,
412 Beacon St.,
Boston, Mass.

ALPHA OMEGA

The Alpha Omega Fraternity will meet at the Kenmore Hotel, Boston, August 24.

MAX JACOBS,
311 Commonwealth Ave.,
Boston, Mass.

TECHNICAL EXHIBITS

Abbott Laboratories, North Chicago, Ill.
Acralite Company, Inc., New York, N. Y.
Aderer, Inc., Julius, New York, N. Y.
American Cabinet Co., Two Rivers, Wis.
Ames Co., W. V-B., Fremont, Ohio
Antidolor Mfg. Co., Inc., New York, N. Y.
Austenal Laboratories, Inc., Chicago, Ill.

Baker & Co., Inc., Newark, N. J.
Bard-Parker Co., Inc., Danbury, Conn.

Barrett Products Co. Inc., Boston, Mass.
Bell Dental Products Co., Inc., New York, N. Y.
Bendick Company, Lapeer, Mich.
Boos Dental Laboratories, Henry P., Minneapolis, Minn.
Buffalo Dental Mfg. Co., Buffalo, N. Y.
Burton Mfg. Co., Chicago, Ill.
Butler Co., John O., Chicago, Ill.

Camel Cigarettes, New York, N. Y.
Carnation Company, Milwaukee, Wis.
Castle Co., Wilmot, Rochester, N. Y.
Caulk Co., L. D., Milford, Del.
Church & Dwight Co., Inc., New York, N. Y.
Cleveland Dental Mfg. Co., Cleveland, Ohio
Columbia Dentoform Corp., New York, N. Y.
Columbus Dental Mfg. Co., Columbus, Ohio
Condit, P. N., Boston, Mass.
Cook Laboratories, Inc., New York, N. Y.
Corega Chemical Co., Cleveland, Ohio
Cosmos Dental Products, Inc., New York, N. Y.
Crimmings Co., J. J., Boston, Mass.

Davis Sales Co., R. B., Hoboken, N. J.
Dee & Co., Thomas J., Chicago, Ill.
Dental Perfection Co., Los Angeles, Calif.
Dentists' Supply Co. of N. Y., New York, N. Y.
Dudley Research Corp., New York, N. Y.

Eastman Kodak Co., Rochester, N. Y.

Friedman Specialty Co., Chicago, Ill.

Garfield Dental Supply Co., Boston, Mass.
Garhart Dental Specialty Co., Cambridge, Mass.
General Electric X-Ray Corp., Chicago, Ill.

Hanau Engineering Co. Inc., Buffalo, N. Y.
Hood Co., John, Boston, Mass.
Hu-Friedy Mfg. Co., Chicago, Ill.

Ideal Tooth Inc., Cambridge, Mass.

Jelenko & Co., Inc., J. F., New York, N. Y.
Johnson & Johnson, New Brunswick, N. J.
Justi & Son, Inc., H. D., Philadelphia, Pa.

Kellogg Co., Battle Creek, Mich.
Kerr Dental Mfg. Co., Detroit, Mich.
Kolynos Co., Jersey City, N. J.
Konformax Laboratories, Inc., Brooklyn, N. Y.
Kromel Laboratories, New York, N. Y.

Lactona Incorporated, St. Paul, Minn.
Lea and Febiger, Philadelphia, Pa.
Lippincott Co., J. B., Philadelphia, Pa.

Manhattan Mfg. Co., Chicago, Ill.
Massachusetts Dental Porcelains Laboratories, Inc., Boston, Mass.
McKesson Appliance Co., Toledo, Ohio
Medical Protective Co., Fort Wayne, Ind.
Merck & Co. Inc., New York, N. Y.
Mizzy, Inc., New York, N. Y.
Mosby Co., C. V., St. Louis, Mo.
Moyer Co., Inc., J. Bird, Philadelphia, Pa.

Ney Co., J. M., Hartford, Conn.
Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y.

Ohio Chemical & Mfg. Co., Cleveland, Ohio

Pelton & Crane Co., Detroit, Mich.
Philip Morris & Co., Ltd., Inc., New York, N. Y.
Precious Metals Research Works, Inc., New York, N. Y.
Premier Dental Products Co., Philadelphia, Pa.
Proco-Sol Chemical Co., Inc., Philadelphia, Pa.
Pycopé, Inc., Jersey City, N. J.

Reynolds Sons Co., S. H., Boston, Mass.
Rinn X-Ray Products, Chicago, Ill.
Ritter Co., Inc., Rochester, N. Y.

Saunders Co., W. B., Philadelphia, Pa.
Schaefer, Oskar, Jersey City, N. J.
Smith & Son Mfg. Co., Lee S., Pittsburgh, Pa.
Star Dental Mfg. Co., Inc., Philadelphia, Pa.
Stern & Co., Inc., I., New York, N. Y.

Thrice-A-Week Co., San Diego, Calif.
Ticonium, Albany, N. Y.

Union Broach Co., Inc., New York, N. Y.
Universal Dental Co., Philadelphia, Pa.

Vernon-Benshoff Co., Pittsburgh, Pa.

Weber Dental Mfg. Co., Canton, Ohio
Wernet Dental Mfg. Co., Jersey City, N. J.
White Dental Mfg. Co., S. S., Philadelphia, Pa.
Williams Gold Refining Co., Inc., Buffalo, N. Y.

1. HOTEL AVERY. 2. HOTEL BRUNSWICK. 4. HOTEL BELLEVUE. 5. HOTEL BRADFORD. 6. HOTEL BUCKMINSTER. 8. HOTEL COMMONWEALTH. 10. THE COPLEY PLAZA. 11. COPLEY SQUARE HOTEL. 12. KENMORE HOTEL. 14. HOTEL LENOX. 15. HOTEL LINCOLNSHIRE. 16. HOTEL MANGER. 17. HOTEL MINERVA. 18. THE MYLES STANDISH. 19. THE PARKER HOUSE. 20. HOTEL PURITAN. 21. THE RITZ CARLTON. 22. HOTEL ESSEX. 23. THE SHERATON. 24. THE SOMERSET. 25. HOTEL STATLER (A. D. A. HEADQUARTERS HOTEL). 26. HOTEL TOUSAINE. 27. HOTEL VICTORIA. 28. HOTEL WESTMINSTER. 29. HOTEL FENSGATE. 30. HOTEL GARDNER. 31. HOTEL VENDOME. 32. MECHANICS' BUILDING (EXHIBITS AND SECTION MEETING).

American Dental Association

Boston, Mass. August 24-28, 1942

HOTEL RESERVATIONS

To secure hotel accommodations for the 1942 Session, consult the rate list on the next page and fill out the attached blank. Mail this immediately to the hotel of your first choice or to the Housing Committee, Room 554, Hotel Statler, Boston, Mass. Confirmation will be sent to you by the hotel.

Second and third choices of hotel should be indicated. If the reservation cannot be made at any of the hotels of your choice, the Housing Committee will place you in as favorable a hotel as possible and will notify you.

Please remember that a reservation constitutes a contract with the hotel to provide you with the accommodations you desire. If you find it impossible to carry out your part of the contract, namely, to occupy the room at the time agreed upon, please write or wire the hotel releasing the room, in order that it may be available for other members.

APPLICATION FOR HOTEL ACCOMMODATIONS

AMERICAN DENTAL ASSOCIATION

Boston, Mass. August 24-28, 1942

HOTEL.....1st choice

HOTEL.....2nd choice

HOTEL.....3rd choice

Kindly reserve the following: ☐ Single room ☐ Double room ☐ Twin beds.

.....rooms with bath for.....persons $.....per room

.....rooms without bath for.....persons $.....per room

Arriving on August.....at.....a.m.....p.m.

ROOMS TO BE OCCUPIED BY:

NAME	ADDRESS IN FULL

NOTE TO HOTEL NAMED AS FIRST CHOICE: If the hotel of first choice is unable to make the reservation requested, this application should be forwarded at once to the Housing Committee, Room 554, Hotel Statler, Boston, Mass.

SCHEDULE OF RATES

ALL ROOMS WITH BATH*

Hotel	Single	Double	Twin	Suite
AVERY, 24 Avery St.		$5.50	$6.60	
BELLEVUE, 21 Beacon St.	$3.85–4.40	$4.95–5.50–6.60	$5.50–6.60–7.15–7.70–8.80	$8.25–8.80–9.90
BRADFORD, 275 Tremont St....	$3.30–3.85–4.40	$5–5.50	$5.50–6.60–7.70	
BUCKMINSTER, 645 Beacon St.		$5		$7–12
COMMANDER, Cambridge, Mass.	$3.30–3.85–4.40	$4.40–5–5.50	$5.50–6–6.60	
CONTINENTAL, Cambridge, Mass.	$3.30–3.50–3.85–4.40	$5.50–6	$5.50–6.50	$10
COPLEY PLAZA, Copley Square	$4.40–5.50–6.60	$7.70–8.80	$8.80–9.90–11–13.20	$13.20–15.40–17.60–19.80–22–24.20–27.50
COPLEY SQUARE, 47 Huntington Ave.	$2.75–3–3.30	$4.40–4.95–5.50–6	$5.50–6–6.60	$8–10
ESSEX, 695 Atlantic Ave.	$2.75–3.30	$4	$5.50	$7.70–8.80
FENSGATE, 534 Beacon St.			$5–8	$12–14
GARDNER, 199 Massachusetts Ave.		$4.40	$4.95–5.50	$6.60–8.60–10.60
KENMORE, 490 Commonwealth Ave.	$3.85–4.40		$5.50–6.60–7.70–8.80	$10
LENOX, Exeter Street	$3–3.50–4	$4–5–6	$5–6–7	$6.60–7.50–10–12–14
LINCOLNSHIRE, 20 Charles St.	$3.85		$6.60	$10–16
MANGER, North Station	$2.75–3.30–3.85–4.40	$3.85–4.40–4.95–5.50	$5.50–6.60	
MINERVA, 214 Huntington Ave.	$3	$4.50	$5	
MYLES STANDISH, 30 Bay State Road	$3.30–3.85	$4.50–5.50	$5.50–6	$7–8
PARKER HOUSE, 60 School St.	$3.85–4.25–4.40–4.95–5.50–6	$5.50–6.15–6.60–7.15	$6.60–7.15–7.70–8.80–9.90	$12–15
PURITAN, 390 Commonwealth Ave.	$4.40		$7.70	$9–12–14
RITZ CARLTON, 15 Arlington St.	$5		$8–9	$12–22–28
SHERATON, 91 Bay State Road	$3.30–3.85	$5.50	$5.50–6.60	$7.70–8.80
STATLER (Headquarters), Park Square	$3.85–4.40–4.95–5.50–6.60–8.80	$5.50–6.05–6.60–7.15–7.70–8.80–11	$6.60–7.70–8.80–9–9.35–10–12	$14.60–14.70–16.80–18–20–22–24.50–26.50
TOURAINE, 62 Boyleston St.	$3.85–4.40–5–5.50–6	$5.50–6–6.50–7	$6–6.50–7.25–8.25	$12–14
VENDOME, 160 Commonwealth Ave.	$3.30		$5.50	$10
VICTORIA, 271 Dartmouth St.		$5		$7.50–10

*Rates on rooms without bath by request.

MEMBERS OF THE HOUSE OF DELEGATES 1942

DELEGATES AND ALTERNATES

ALABAMA

Delegates
Allen, Hunter S., Comer Building, Birmingham
Blue, James A., Merchants Bank Building, Mobile
Dillon, L. B., Woodward Building, Birmingham

Alternates
McGavock, R. J., Woodward Building, Birmingham
Gillespy, J. S., Jr., Frank Nelson Building, Birmingham
McKinnon, H. T., Jr., Troy

ARIZONA

Delegate
Bennett, Paul H., Valley Nat'l Building, Tucson

Alternate
Creamer, R. Dean, Professional Building, Phoenix

ARKANSAS

Delegates
Flanagan, J. H., Conway
Sternberg, I. M., Merchants Bank Building, Fort Smith

Alternates
Brasel, A. C., Dermott
Hunt, W. R., Jr., Clarksville

SOUTHERN CALIFORNIA

Delegates
Conley, Francis J., 1052 W. 6th St., Los Angeles
Goodman, Nye W., 3780 Wilshire Blvd., Los Angeles
Gould, I. Eugene, First Trust Building, Pasadena
Harris, Henry L., Union Bank Building, Los Angeles
Kulstad, Hugo M., 6381 Hollywood Blvd., Hollywood
Neblett, W. Stuart, 3705 Main St., Riverside
Reagan, Charles A., 1930 Wilshire Blvd., Los Angeles
Tylicki, B. M., 547 Broadway, Long Beach
Van Buskirk, Guy, 1930 Wilshire Blvd., Los Angeles
Vieille, Albert C., Roosevelt Building, Los Angeles
Wallace, H. E., 603 N. Spadra Road, Fullerton

Alternates
Ariaudo, A. A., Kraft Building, Ocean Beach
Brownson, E. Ray, Wilshire Professional Building, Los Angeles
Brownson, H. Newman, 7046 Hollywood Blvd., Hollywood
Casto, Frank M., 801 Silverado Ave., La Jolla
Hogeboom, Floyd E., Pellissier Building, Los Angeles
McCollum, B. B., Professional Building, Los Angeles
Paul, Cassius B., Moore Building, Santa Ana
Pierce, J. Madison, 4401 Melrose Ave., Los Angeles
Schildwachter, F. D., Edwards & Wildey Building, Los Angeles
Thompson, W. S., 727 W. 7th St., Los Angeles
Webber, Chester H., Bank of America Building, San Diego

CALIFORNIA STATE

Delegates
Hahn, George W., 745 Parnassus Ave., San Francisco
Johnson, Chester W., 450 Sutter St., San Francisco
Sloman, Ernest G., 344 14th St., San Francisco
Fleming, Willard C., 1906 Franklin St., Oakland
Gurley, John E., 350 Post St., San Francisco
Kingsbury, B. C., 490 Post St., San Francisco
Bishop, Lyall O., Bank of America Building, Berkeley

Alternates
Graham, James Allen, 209 Post St., San Francisco
Becks, Hermann, U. S. Hooper Foundation, San Francisco
Werner, Jack, 344 14th St., San Francisco
Gill, J. Raymond, 450 Sutter St., San Francisco
Sweet, Charles A., 2940 Summit St., Oakland
Fahden, Wilbur J., 700 Alhambra Ave., Martinez

COLORADO

Delegates
Christy, Ralph L., Majestic Building, Denver
Brown, C. J., La Junta
Johnston, L. W., Denver

CONNECTICUT

Delegates
Allen, B. H., 647 Main St., Hartford
Gibb, Hugh, Jr., 107 Whitney Ave., New Haven
Arnold, E. S., 37 Linnard Road, West Hartford
Hicks, Henry, 5 Glen Court, Greenwich
Peterson, C. E., 9 Elm St., Rockville
Brooks, C. G., 302 State St., New London

Alternates
Murren, John P., Medical Building, Bridgeport
Fitch, A. W., 140 State St., New London
Vivian, C. W., 58 Elbridge Road, New Britain
Quinn, H. T., 255 Greenwich Ave., Greenwich
Loftus, J. L., 50 Farmington Ave., Hartford
Bray, J. A., 99 Pratt St., Hartford

DELAWARE

Delegate
Traynor, P. A., 807 Washington St., Wilmington

Alternate
Nelson, C. A., Milford

DISTRICT OF COLUMBIA

Delegates
Fitzgibbon, David J., 1801 Eye St., N.W., Washington
Weakley, A. D., 1029 Vermont Ave., N.W., Washington
Brown, James W., 1726 Eye St., N.W., Washington

Alternates
Burke, John P., Colorado Building, Washington
Smith, George Albert, 1835 Eye St., N.W., Washington
Clendenin, George B., 1801 Eye St., N.W., Washington

FLORIDA

Delegates
Harlow, L. N., State Board of Health, Jacksonville
Wood, W. P., Jr., 442 W. Lafayette St., Tampa
Thompson, E. L., 326½ S. Beach St., Daytona Beach
Lunsford, E. C., 2742 Biscayne Blvd., Miami

Alternates
Kellner, A. W., Central Arcade, Hollywood
Renado, J. M., Huntington Building, Miami
Cartee, H. L., Huntington Building, Miami
Farver, A. D., 541 Lincoln Road, Miami Beach

GEORGIA

Delegates
Mason, R. Holmes, Macon
Mitchell, J. Russell, Candler Building, Atlanta
Banks, W. H., Montezuma

Alternates
Grant, T. A., 118 E. Jones St., Savannah
Weichselbaum, William, Savannah
Maxwell, V. L., Augusta

IDAHO

ILLINOIS

Delegates
Vedder, N. D., Carrollton
Hurlstone, F. J., 30 N. Michigan Ave., Chicago
Jacob, L. H., Jefferson Building, Peoria
McNulty, R. W., 1757 W. Harrison St., Chicago
Hillenbrand, Harold, 100 W. North Ave., Chicago
Davidson, Christian, 55 E. Washington St., Chicago
Farrell, Frank A., 757 W. 79th St., Chicago

Bray, Willis J., 185 N. Wabash Ave., Chicago
Logan, W. H. G., 55 E. Washington St., Chicago
Kremer, Leo W., 55 E. Washington St., Chicago
Zielinski, Joseph B., 3147 Logan Blvd., Chicago
Keith, James H., 636 Church St., Evanston
Kurth, L. E. 2750 W. North Ave., Chicago
Hughes, Luther W., 15426 Center Ave., Harvey
Wendel, Earl F., Central Life Building, Ottawa
Hoge, Dale H., Woodruff Clinic, Joliet
Glawe, Arthur E., Safety Building, Rock Island
Moss, Z. W., Dixon
Chamberlain, Clarke E., Jefferson Building, Peoria
Gonwa, W. J., Chrisman
McMillan, L. G., Temple Building, Danville
Green, John W., First Nat'l Bank Building, Springfield
Wolfe, L. H., Illinois State Bank Building, Quincy
Mahoney, J. E., Wood River

Alternates
McKee, William A., Benton
Mayer, W. E., 636 Church St., Evanston
Rost, T. A., Durley Building, Bloomington
Idler, P. B. D., 932 Ashland Ave., Wilmette
Freeman, Charles W., 8 S. Michigan Ave., Chicago
Oppice, Harold W., 1002 Wilson Ave., Chicago
Kesel, Robert G., 808 S. Wood St., Chicago
Coolidge, Edgar D., 25 E. Washington St., Chicago
Hodgman, D. Munger, 55 E. Washington St., Chicago
McNeil, W. I., Mallers Building, Chicago
Guerrero, J. J., 3952 Jackson Blvd., Chicago
Haberle, F. E., 55 E. Washington St., Chicago
Ryan, E. J., 708 Church St., Evanston
Baumann, Edwin W., 108 N. Evergreen Ave., Arlington Heights
Blackman, Lloyd C., Professional Building, Elgin
Patterson, A. B., Morris Building, Joliet
Acton, H. L., Lawrence Building, Sterling
Griffith, E. L., Freeport
Brown, H. C., Unity Building, Bloomington
Foster, H. S., Temple Building, Danville
Berryhill, Paul B., Standard Office Building, Decatur
Doolen, D. E., Lincoln
Pacey, Walter, Bank of Galesburg Building, Galesburg
Kurz, Charles S., Carlyle

INDIANA

Delegates
Gillis, R. R., 134 Rimbach St., Hammond
Douglas, R. N., 506½ S. Second St., Elkhart
Bogie, William, American Nat'l Bank Building, Vincennes
Westfall, B. K., Hume-Mansur Building, Indianapolis
Crawford, W. H., 1121 W. Michigan St., Indianapolis
Leavell, Fred W., Station Hospital, Camp Croft, South Carolina
Smiley, Roy D., Peoples Bank & Trust Building, Washington
Ewbank, E. E., Kingman

Alternates
Carr, J. B., Hume-Mansur Building, Indianapolis
Walters, W. S., 303½ State St., West Lafayette
Mason, Herbert W., 658 Fairfield Ave., Indianapolis
Mitchell, E. L., Hume-Mansur Building, Indianapolis
Risk, Paul A., Schultz Building, Lafayette
Mayfield, C. T., Armstrong Landon Building, Kokomo
Baker, Frederick C., 5231 Hohman St., Hammond
Longcamp, H. J., Gibson Building, Aurora

IOWA

Foster, C. S., Dows Building, Cedar Rapids
Whinery, F. B., J. C. Bank Building, Iowa City
Pool, Hardy F., 313 M.B.A. Building, Mason City
Hildebrand, J. G., Blackhawk Building, Waterloo
FitzGerald, L. M., Roshek Building, Dubuque
Hemsworth, L. C., Black Building, Waterloo
Stewart, C. H., Farragut

Alternates
Bolks, H. G., Badgerow Building, Sioux City
Bryan, A. W., Iowa City
Leonard, J. P., Union Bank Building, Davenport
Conzett, J. V., Dubuque
Charters, W. J., Southern Surety Building, Des Moines
Ostrem, Carl T., Equitable Building, Des Moines
Atkins, A. P., 3519 Sixth Avenue, Des Moines

KANSAS

Delegates
Robison, Homer B., Rorabaugh-Wiley Building, Hutchinson
Richmond, Fred A., Huron Building, Kansas City
Buff, A. J., Mills Building, Topeka
Kramer, Leon R., National Reserve Building, Topeka

Alternates
Olson, R. E., Union Nat'l Bank Building, Wichita
Bunker, H. L., Junction City
Morgan, John E., Emporia
Hodge, E. L., McPherson

KENTUCKY

Delegates
Thomas, R. P., Francis Building, Louisville
Wilson, O. D., Masonic Building, Owensboro
Hume, E. C., Francis Building, Louisville
Walker, J. L., 640 Barbee Way South, Louisville

Alternates
Childers, L. M., First Nat'l Bank Building, Lexington
Essig, J. I., Heyburn Building, Louisville
Sprau, Robert L., 970 Baxter Ave., Louisville
Pearcy, Charles S., Starks Building, Louisville

LOUISIANA

Delegates
Tiblier, Sidney L., Canal Bank Building, New Orleans
Schoeny, Leo J., Maison Blanche Building, New Orleans
Dupuy, Larry J., 217 Camp St., New Orleans

Alternates
Comeaux, Walter L., Louisiana Nat'l Bank Building, Baton Rouge
Broussard, A. C., Maison Blanche Building, New Orleans
Jarrell, M. F., Commercial Bank Building, Alexandria

MAINE

MARYLAND

Delegates
Bell, Arthur I., Medical Arts Building, Baltimore
Hopkins, J. S., Bel Air
McCarthy, H. B., 5821 Bellona Ave., Baltimore
Leonard, R. C., 2411 N. Charles St., Baltimore

Alternates
Aisenberg, M. S., 3619 Rosedale Road, Baltimore
Lovett, Ethelbert, Medical Arts Building, Baltimore
Willis, G. A., Havre de Grace
Deems, Paul A., 835 Park Ave., Baltimore

MASSACHUSETTS

Delegates
Grant, Frederick E., 603 High St., Dedham
Cronin, Harold J., 739 Liberty St., Springfield
Wallace, John R., 1 Mt. Vernon St., Winchester
Adams, Philip E., 106 Marlborough St., Boston
Tingley, Harold E., 12 Bay State Road, Boston
Lawrence, Glenn W., 412 Beacon St., Boston
Blumenthal, Fred R., 1 Raleigh St., Boston
Rounds, Charles E., 19 Bay State Road, Boston
Peters, Maurice E., 60 Charlesgate W., Boston
Alden, Harold W., 160 Main St., Northampton
Griffin, William H., 520 Beacon St., Boston

Alternates
Brown, George Cowles, 332 Main St., Worcester
Gibbons, John J., 373 Commonwealth Ave., Boston
Shuman, Harry B., 29 Commonwealth Ave., Boston
Bryans, Walter J., 76 Parks St., Lee
Holmes, Matthew C., 1570 Main St., Springfield
Farrell, Joseph W., 246 North St., Pittsfield
Breen, John A., 506 Commonwealth Ave., Boston
Bommer, Arno M., 340 Broadway, Revere
Daley, Francis H., 1085 Boylston St., Boston
Giblin, Thomas J., 476 Commonwealth Ave., Boston
Titus, Paul K., 59 State St., Newburyport

MICHIGAN

Delegates
Hooper, L. E., Wyandotte Nat'l Bank Building, Wyandotte
Wright, C. J., American State Bank Building, Lansing
Applegate, O. C., 216 S. State St., Ann Arbor
DeVilliers, M. S., 4400 Livernois Ave., Detroit
Jaxtimer, J. P., 14503 E. Jefferson Ave., Detroit
Matson, C. H., Dryden Building, Flint

Jamieson, C. H., 8545 Gratiot Ave., Detroit
Eman, V. H., Medical Arts Building, Grand Rapids
Andrews, L. H., 1600 Niles Ave., St. Joseph
Ward, M. L., 1308 Cambridge Road, Ann Arbor
McGuigan, F. G., 22150 W. Michigan Ave., Dearborn

Alternates
Davis, William R., Michigan Dept. of Health, Lansing
Henry, F. J., 1170 Madison Ave., S.E., Grand Rapids
Taylor, C. R., Michigan Dept. of Health, Lansing
Wertheimer, Fred, Fairplain Ave., Benton Harbor
Applegate, S. G., Eaton Tower, Detroit
Easlick, K. A., University of Michigan, Ann Arbor
Northrop, P. M., 705 N. University Ave., Ann Arbor
Prince, M. W., 7634 Dexter Blvd., Detroit
White, O. W., David Whitney Building, Detroit
Lowery, P. C., 8545 Gratiot Ave., Detroit
Jeserich, P. H., University of Michigan, Ann Arbor

MINNESOTA

Delegates
Swanson, Clayton A., 1009 Nicolett Ave., Minneapolis
Cruttenden, L. M., 498 Lowry Building, St. Paul
Flagstad, C. O., Medical Arts Building, Minneapolis
Gyllenborg, L. C., Medical Arts Building, Minneapolis
Larson, G. Edward, Saint Peter
Merwin, O. J., 478 S. Snelling Ave., Saint Paul
Pike, Joe M., Medical Arts Building, Minneapolis
Schmidt, A. R., Worthington
Thom, L. W., Medical Arts Building, Minneapolis
Webb, W. Lester, Fairmont

Alternates
Bonner, M. E., 392 S. Fairview Ave., Saint Paul
Ernst, Max E., Lowry Building, Saint Paul
Irwin, V. D., Minnesota Dept. of Health Building, University Campus, Minneapolis
Johnson, Raymond E., Lowry Building, Saint Paul
Luak, M. E., Medical Arts Building, Minneapolis
Miner, C. L., Saint Cloud
Simonson, A. W., Medical Arts Building, Minneapolis
Walls, M. G., Lowry Building, Saint Paul
Washburn, H. B., Lowry Building, Saint Paul
Westerdahl, H. O., 4829 Minnetonka Blvd., Minneapolis

MISSISSIPPI

Delegates
Williams, Fayette, Corinth
Abbott, Rush P., West Point

Alternates
Henderson, A. H., Greenville
Williams, D. C., 338 Chippewa St., Brookhaven

MISSOURI

Delegates
Purcell, T. E., 3556 Caroline St., St. Louis
Shanley, Leo M., 7800 Maryland Ave., St. Louis
Poe, E. J., Paul Brown Building, St. Louis
Rinehart, R. J., Kansas City-Western Dental College, Kansas City
Allshouse, Harry A., 6333 Wyandotte St., Kansas City
Frost, Ralph W., Bryant Building, Kansas City
Grant, Jack, Frisco Building, Joplin
Miller, Jesse, Maryville

Alternates
Kimmey, Virgil A., Beaumont Medical Building, St. Louis
Thompson, V. P., 111 W. Lockwood Ave., Webster Groves
Hayden, Francis M., 2900 N. Union Ave., St. Louis
Edwards, Ralph W., 17 E. 63th Street, Kansas City
Northcutt, J. E., Bryant Building, Kansas City
Ross, G. L., Professional Building, Kansas City
Ritchey, J. S., Frisco Building, Joplin
Magee, H. N., Kirkpatrick Building, St. Joseph

MONTANA

Delegates
Rafish, S. M., Butte
Betzner, T. C., Box 740, Helena

Alternates
Tucker, E. W., Butte

NEBRASKA

Delegates
Pierson, F. A., Federal Securities Building, Lincoln
Hunt, L. T., Security Mutual Building, Lincoln
King, H. E., Medical Arts Building, Omaha
Leonard, F. W., 2707½ 13th St., Columbus

Alternates
Barber, H. D., Barker Building, Omaha
Whitcomb, F. F., Medical Arts Building, Omaha
Colgan, J. G., McCook
Spencer, G. L., Sharp Building, Lincoln

NEVADA

NEW HAMPSHIRE

Delegates
Jacobs, Leon H., Exeter
Godfrey, E. C., Dover

Alternates
Frost, R. C., Beacon Building, Manchester
Copeland, Harold E., Rochester

NEW JERSEY

Delegates
Hanley, James L., 386 Central Ave., East Orange
Hopper, Craft A., 534 Broadway, Paterson
Jennings, E. J., 126 W. State St., Trenton
Houghton, Frank J., 50 Glenwood Ave., Jersey City
Brach, Louis, 112 Monticello Ave., Jersey City
Reese, Sylvanis F., Weymouth & Atlantic Aves., Ventnor
Reock, Ernest C., 367 Washington Ave., Belleville
Weber, Paul M., Citizens Nat'l Bank Building, Englewood
Crowe, Charles P., 521 Main St., East Orange
Connell, Bertrand T., 26 Journal Square, Jersey City
Carr, John G., 414 Cooper St., Camden
Newman, Eugene W., 16 Wallace St., Red Bank

Alternates
Schneider, Ernest J. H., 519 Prospect St., Maplewood
Giordano, James V., 425 Union Ave., Paterson
Devlin, Gerard A., 31 Lincoln Park, Newark
White, Edward R., 921 Bergen Ave., Jersey City
Burke, J. Frank, 921 Bergen Ave., Jersey City
Roberts, Eugene W., 875 Haddon Ave., Collingswood
Lyons, Stephen M., 382 Springfield Ave., Summit
Wisan, J. M., Broad Street Bank Building, Trenton
Schweikhardt, C. J., 68 Belmont Ave., Newark
Wilson, Walter A., 28-32 Duncan Ave., Jersey City
Owens, John S., 414 Cooper St., Camden
De Monseigle, E., 711 Grand Ave., Asbury Park

NEW YORK

Delegates
Adams, Fred R., 55 West 42nd St., New York
Bell, Willard S., 118-02 Rockaway Blvd., Ozone Park
Burgun, Joseph A., 142 Joralemon St., Brooklyn
Burkhart, Harvey J., Box 879 E. Ave., P. O., Rochester
Burns, Gerard G., 35 Chestnut St., Rochester
Burr, LeRoy E., 27 Ludlow St., Yonkers
Callaway, George S., 654 Madison Ave., New York
Carter, John H., 143 Mohawk St., Cohoes
Craner, Charles M., State Tower Building, Syracuse
Cullen, Thomas R., 189 W. First St., Oswego
Fennelly, William A., 21 E. 40th St., New York
Koepf, Sheldon W., 333 Linwood Ave., Buffalo
McCarthy, Frank M., First Nat'l Bank Building, Olean
McKean, N. D., Savings Bank Building, Cortland
Merritt, Arthur H., 580 Madison Ave., New York
Mork, Waldo H., 501 Madison Ave., New York
Murray, R. Leslie, 70 Linwood Ave., Buffalo
Neuber, Augustave, 619 Union St., Schenectady
Phillips, Percy T., 400 Madison Ave., New York
Quinn, Walter A., 1146 St. Nicholas Ave., New York
Schuyler, Clyde H., 400 Madison Ave., New York
Stevens, Walter W., 50 Noxon St., Poughkeepsie
Tench, Russell W., 745 Fifth Ave., New York
Wells, C. Raymond, Selective Service System, Medical Division, Washington, D. C.
Whitson, Glenn H., 80 Hanson Place, Brooklyn
Wilkie, Charles A., 1 Hanson Place, Brooklyn
Zillman, Paul W., 29 Walden Ave., Buffalo

Alternates
Bailey, Adams, 1 E. 57th St., New York
Brown; Harold O., 42 East Ave., Rochester
Chase, Oscar J., 140 E. 54th St., New York
Douglass, George C., 80 Hanson Place, Brooklyn
Dunning, James M., 140 E. 80th St., New York
Flynn, John T., Harwood Building, Scarsdale
Guenther, John A., 1003 Genesee St., Buffalo

Howland, Wells, 122 Front St., Binghamton
Johnson, Gustaf B., 1 Hanson Place, Brooklyn
Jones, Paul, 89 East Ave., Rochester
Knight, Hubert O., Dillaye Building, Syracuse
Lindsay, J. F., 4 Market St., Amsterdam
Litten, Arthur S., 238 Central Park West, New York
Lynch, John D., 738 Ridge Road, Lackawanna
MacDonald, C. Franklin, 501 Madison Ave., New York
Madison, Duane B., Herkimer
Morris, J. Harold, Hudson River State Hospital, Poughkeepsie
Moss, Harry M., 57 W. 57th St., New York
Rea, Floyd G., 142 Joralemon St., Brooklyn
Shanahan, Thomas E. J., 862 Carroll St., Brooklyn
Shapiro, Benjamin, 849 Eastern Parkway, Brooklyn
Smith, Edwin F., 90 State St., Albany
Tracy, Martin C., 9 Rockefeller Plaza, New York
VanValey, E. G., 38 East 61st St., New York
Walker, Clair U., Fredonia
Webb, William R., Jr., 34-41 79th St., Jackson Heights
Wolpert, H. Donald, Bewley Building, Lockport

NORTH CAROLINA

Delegates
Lineberger, H. O., Raleigh
McFall, Walter E., Flat Iron Building, Asheville
Jones, Paul E., Farmville
Jackson, Wilbert, Clinton

Alternates
Alford, F. O., First Nat'l Bank Building, Charlotte
Fitzgerald, Paul, Greenville
Breeland, W. H., Belmont
Martin, W. T., Professional Building, Raleigh

NORTH DAKOTA

Delegates
Musburger, L. E., Jamestown
Follett, W. C., Devils Lake

Alternates
Sweet, C. F., Minot
Bousquet, V. A., Maddock

OHIO

Delegates
Gentilly, James V., Rose Buiding, Cleveland
Jarvis, H. C., Mercantile Library Building, Cincinnati
Stephan, John F., Keith Building, Cleveland
Mills, E. C., 255 E. Broad St., Columbus
Young, O. M., Marion
Pryor, W. J., Rose Building, Cleveland
Schott, Carlos H., Neave Building, Cincinnati
Ball, E. L., Doctors Building, Cincinnati
McDermott, T. J., Rose Building, Cleveland
Hebble, C. H., Medical Arts Building, Columbus
Wolford, W. H., Farmers Bank Building, Mansfield
Jones, Earl G., 185 E. State St., Columbus
Dalton, V. B., 116 Garfield Place, Cincinnati
Black, F. W., Doctors Building, Cincinnati

Alternates
Cosgray, W. J., Edison Building, Toledo
Pursell, F. M., Second Nat'l Bank Building, Akron
Longfellow, J. C., Bellefontaine
Cottrell, H. V., Hartman Building, Columbus
Hurst, W. W., 2165 Adelbert Road, Cleveland
Sargent, W. S., Nicholas Building, Toledo
Travis, J. W., 2679 Monroe St., Toledo
Bach, E. N., Professional Building, Toledo
Way, T. I., Doctors Building, Cincinnati
Wylie, W. L., 2165 Adelbert Road, Cleveland
Aufderheide, P. J., Rose Building, Cleveland
Hayden, W. H., 228 Lincon Ave., Youngstown
Pettibone, E. L., 14805 Detroit Ave., Lakewood
Gregg, C. C., Rittman

OKLAHOMA

Delegates
Hess, Charles A., Durant
Warrick, H. O., Broadway Tower, Enid

Alternates
Bertram, Frank P., Oklahoma Dept. of Health, Oklahoma City
Seids, Fred C., Perry

OREGON

Delegates
Bettman, M. M., Medical Arts Building, Portland
Weeks, A. F., Selling Building, Portland
Harris, M. C., Tiffany Building, Eugene

Alternates
Robinson, S. C., Selling Building, Portland
Walrath, H. C., Selling Building, Portland
Bartels, J. C., Selling Building, Portland

PANAMA CANAL ZONE

PENNSYLVANIA

Delegates
Ennis, L. M., 4001 Spruce St., Philadelphia
Ventura, A. L., 333 DeKalb St., Norristown
Miller, A. H., 299 Wyoming Ave., Kingston
Willits, H. K., 750 N. Tenth St., Reading
Bomberger, P. E., 116 E. Chestnut St., Lancaster
Nesbit, B. S., Sunbury
Harkins, C. S., Box 176, Osceola Mills
Heeter, L. H., Clarion
Balthaser, J. B., 549 W. Eighth St., Erie
Friesell, H. E., University of Pittsburgh Dental School, Pittsburgh
Robinson, Fred C., Fayette T. & T. Building, Uniontown
Lowry, B. A., 1st Nat'l Bank Building, Williamsport
Walls, R. M., 48 E. Market St., Bethlehem
Hess, Lawrence E., 1243 W. Alleghany Ave., Philadelphia
Luckie, S. Blair, 333 E. Broad St., Chester
Forbes, J. Wallace, Medical Arts Building, Philadelphia
McCready, W. A., Highland Building, Pittsburgh
Lawson, A. S., 524 Federal St. N.S., Pittsburgh
Price, J. B., 6013 Greene St., Germantown, Philadelphia
Kelly, Wayde D., Payne-Shoemaker Building, Harrisburg

Alternates
Cohen, Abraham, 4727 Rising Sun Ave., Philadelphia
Reichard, H. C., Riant Theatre Building, Conshohocken
Corcoran, J. H., Scranton Life Building, Scranton
Brennan, N. C., 13 S. Main St., Shenandoah
Young, G. W., 707 N. Second St., Harrisburg
Williamson, C. W., Williamsport
Crouse, H. M., 1002 Johnstown Trust Building, Johnstown
Crosby, J. M., I.O.O.F. Building, Bradford
Phillips, G. S., Masonic Building, Meadville
Mendel, W. E., 405 Ohio St., Pittsburgh
Craig, J., 1731 Moore St., Philadelphia
Hirtle, J. E., 130 Main St., Bath
Levy, Sol, Medical Arts Building, Scranton
Strayer, E. R., 269 S. Nineteenth Street, Philadelphia
Archer, W. H. Jr., Professional Building, Pittsburgh

PHILIPPINE ISLANDS

PUERTO RICO

RHODE ISLAND

SOUTH CAROLINA

Delegates
Dick, George W., Sumter
Rabb, F. K., Wentworth St., Charleston

Alternates
Dunlap, T. B., Sumter
Dellinger, L. E., Greenville

SOUTH DAKOTA

Delegates
Elmen, E. W., Sioux Falls
Henderson, W. P., Sioux Falls

Alternates
Donahoe, J. D., 335 N. Summit Ave., Sioux Falls
Lind, D. A., Belle Fourche

TENNESSEE

Delegates
Wood, Claude R., Medical Arts Building, Knoxville
Brooks, W. B., Hamilton Nat'l Bank Building, Chattanooga

Elam, Roy O., Medical Arts Building, Nashville
Taylor, E. W., Exchange Building, Memphis

Alternates
Sharp, J. Guilford, Medical Arts Building, Knoxville
Braly, T. E., Volunteer Building, Chattanooga
Seeman, George F., Doctors Building, Nashville
Towner, Justin D., Exchange Building, Memphis

TEXAS

Delegates
Rogers, R. L., Medical & Professional Building, Amarillo
Newton, Walter T., Esperson Building, Houston
Lux, Konrad, Medical Arts Building, Waco
Crabb, Lloyd A., Medical Arts Building, Dallas
Robertson, G. P., Nix Professional Building, San Antonio
Hinds, Fred W., 1420 Hall St., Dallas
Talbot, W. O., Trinity Life Building, Fort Worth
Ogle, Willard, Medical Arts Building, Dallas

Alternates
Hays, Stuart E., Medical Arts Building, San Antonio
Thielen, B. F., First Nat'l Bank Building, Paris
Elliott, Fred C., 1018 Blodgett Ave., Houston
Maddox, Ray A., Box 1920, Abilene
Butler, C. E., Medical Arts Building, San Antonio
Boelsche, Ralph A., Esperson Building, Houston
Outlaw, J. W., San Jacinto Building, Beaumont
Vogan, J. W., Alvin

UTAH

VERMONT

VIRGINIA

Delegates
Hodgkin, W. N., Warrenton
John, J. E., Medical Arts Building, Roanoke
Goad, G. M., Hillsville
Bear, Harry, Professional Building, Richmond

Alternates
Garrard, C. K., Allied Arts Building, Lynchburg
Wash, A. M., Medical Arts Building, Richmond
Muir, N. F., Shenandoah Life Building, Roanoke
Lyons, Harry, Professional Building, Richmond

WASHINGTON

Delegates
Barlow, T. M., Bellingham, Nat'l Bank Building, Bellingham
Martin, A. L., Medical & Dental Building, Seattle
Jeffery, A. W., Medical & Dental Building, Seattle
Fleetwood, C. T., Medical & Dental Building, Seattle

Alternates
Zech, L. W., Medical & Dental Building, Seattle
Johnson, C. W., Medical Arts Building, Tacoma
Foote, L. L., Medical & Dental Building, Seattle
Stansbery, C. J., Medical & Dental Building, Seattle

WEST VIRGINIA

Delegates
Boydston, W. J., Fairmont
Summers, Howard E., First Nat'l Bank Building, Huntington
Cleek, L. D., Medical Arts Building, Charleston

Alternates
Poindexter, J. B., Professional Building, Huntington
Douglass, E. D., Parkersburg
Caldwell, W. E. H., Wheeling

WISCONSIN

Delegates
Moen, O. H., Watertown
Hardgrove, T. A., Fond du Lac
Morgan, G. E., 2039 N. Prospect Ave., Milwaukee
Martin, F. J., Medford
Bull, F. A., 3887 N. 18th St., Madison
Baumann, C. J., 408 W. Greenfield Ave., Milwaukee
Justin, J. P., 2225 W. Capitol Drive, Milwaukee
Wilson, G. W., 5708 Washington Blvd., West, Milwaukee
Remington, V. K., Chippewa Falls
Bennett, Glenn, Wisconsin Rapids

Alternates
Collins, C. P., 625 57th St., Kenosha
Pratt, H. K., Irving Zuelke Building, Appleton
Leinfelder, M. J., Exchange Building, LaCrosse
Newbury, W. J., Burlington
Zimmer, A. J., Vogelsong Building, Manitowoc
Smith, Melville W., Janesville
Nelson, C. A., Amery
Finke, A .H., 925 N. 8th St., Sheboygan
Newby, G. W., Platteville
Wahl, L. P., 309½ Jackson St., Wausau
Ritsch, Claude H., Beaver Dam

ARMY

Delegate
Milburn, Eugene, First Corps Area, Boston, Mass.

Alternate
Chesser, Page P. A., Camp Edwards, Mass.

NAVY

Delegate
Rault, Clemens V., New York Navy Yard, New York, N. Y.

Alternate
Delaney, Henry R., Naval Training Station, Newport, R. I.

U. S. PUBLIC HEALTH SERVICE

Delegate
Wright, William T., Jr., U. S. Public Health Service, Washington, D. C.

Alternate
Lloyd, Ralph S., U. S. Marine Hospital, Baltimore, Md.

U. S. VETERANS ADMINISTRATION

Delegate
Fowler, Milburn M., Veterans Administration, Washington, D. C.

Alternate
Delaney, Henry A., Veterans Administration, Boston, Mass.

OBITUARY

JOHN PETER BUCKLEY, D.D.S., Ph.D., F.A.C.D.
1873-1942

JOHN PETER BUCKLEY, son of William and Nancy E. (Darst) Buckley, was born December 20, 1873, on a farm near Lowell, Ind. He died May 14, 1942, at the Hollywood Presbyterian Hospital, Hollywood, Calif., at the age of 68 years.

After graduating from the Lowell High School, he matriculated at the Northern Indiana Normal School (now Valparaiso University). He began teaching public school at the age of 20. In 1895, he was drug clerk for George W. Waters, of Lowell, and, while thus occupied, he took a course in pharmacy and chemistry by mail. In 1896, he entered Valparaiso University, majoring in pharmacy. He graduated in August of the same year. In 1898, he graduated from the Chicago College of Dental Surgery. While a student in the dental college, he had charge of the laboratory work in experimental and analytical chemistry. In 1903, he was appointed professor of materia medica and therapeutics in the department of dentistry of Illinois University. In 1904, he was appointed professor of materia medica and therapeutics in the Chicago College of Dental Surgery, a position which he held until 1927. He was a charter member and one of the founders of the American College of Dentists.

Dr. Buckley practiced dentistry in Chicago until 1918, when he moved to Hollywood, Calif., for the benefit of his health. Each year, he returned to Chicago for a few months to teach materia medica and therapeutics in the Chicago College of Dental Surgery. He taught Dental Economics in the Department of Dentistry of the University of Southern California from 1919 to 1926.

From 1907 to 1908, he was editor of the *Dental Digest* and, in 1909, he published the first edition of his book, "Modern Dental Materia Medica, Pharmacology and Therapeutics," which soon was adopted by, and has continued to be a standard textbook in, many universities.

One of his outstanding contributions to his profession is the formocresol treatment of pulpless teeth and the desensitizing paste for control of pain in the preparation of sensitive tooth cavities.

In 1902, Dr. Buckley was president of the Alumni Association of the Chicago College of Dental Surgery. He was president of the Chicago Odontographic Society in 1904, president of the Illinois State Dental Association in 1915 and President of the American Dental Association in 1923. In 1928, he was supreme grand master of the Delta Sigma Delta Fraternity and he was a past-president of the Chicago auxiliary of the same organization.

Dr. Buckley was a past master of Hesperia Lodge No. 411, A. F. and A. M., and a member of the Hollywood chapter of R. A. M., Hollywood Commandery Knights Templar and Al Malaikah Temple A. A. O. N. M. S. He was an elder of the First Presbyterian Church of Hollywood and one of its trustees for fifteen years. He was president of the Hollywood Y.M.C.A. and a past president of the California State Y.M.C.A. association. He was the first president of the Hollywood Kiwanis Club and was a past lieutenant governor of the third Kiwanis District of California.

In 1934, Dr. Buckley was foreman of the Los Angeles County Grand Jury and served on the Committee of 25 that sponsored the recall of Frank L. Shaw, mayor of Los Angeles, and was instrumental in inducing Fletcher Bowron to run for that office, to which he was elected. In 1938, Dr. Buckley was appointed by Mayor Bowron as a member of the Los Angeles

Police Commission. Many citizens of Los Angeles believe it was the teaming of Dr. Buckley and Fletcher Bowron, then a superior court judge in charge of the 1934 grand jury, that started the successful fight for good government in Los Angeles.

During none of his last twenty years of activity was Dr. Buckley ever physically fit, but he never complained, and he worked incessantly for the betterment of his community. He gave his life in the cause of civic improvement."

Dr. Buckley was a member of the First District Dental Society of Los Angeles, the Southern California State Dental Association and the American Dental Association. He was an honorary member of many state dental associations, to the programs of which he had contributed.

September 25, 1898, Dr. Buckley married Jennie M. Snyder, of Chicago, who

JOHN PETER BUCKLEY, D.D.S., Ph.D., F.A.C.D.

of his profession and his community. At the time of his entering the hospital, he was a member of the tire rationing board of the Hollywood area and he devoted many hours daily to that work.

John B. Kingsley, president of the Hollywood Chamber of Commerce and an associate of Dr. Buckley in many civic activities, said of him: "He could have lived many more years comfortably if he would have thought of himself instead

survives him. He leaves a son, Clarence E. Buckley, a prominent dentist in Hollywood, and three grandchildren, John Peter, Joan and Jerry, and one sister, Mrs. Julia M. Hayden, of Gary, Ind.

Dr. Buckley possessed the rare faculty of being on the right side of every question. He was a tireless fighter for the right in his profession as well as in all civic matters. He was a loyal and dependable friend, a most energetic man,

even in the face of his physical handicaps, and was a crusader for every phase of civic righteousness and honesty. He was a diligent student, a teacher, an author, an organizer and a fluent orator.

May 7, 1942, Dr. Buckley was operated on for the relief of a duodenal ulcer. He appeared to be gaining strength satisfactorily soon after operation, but complications arose and, May 14, he died, of pulmonary edema.

The following tribute by radio was paid to Dr. Buckley by Mayor Bowron, May 14:

To my friends, to all supporters of good government in the City of Los Angeles: I would like to say a few words in tribute to a great soul who has passed on. This morning, the abundant and useful life of Dr. John P. Buckley ended. He was a great soul. He was my friend.

I first came to know Dr. John Buckley when he was a member of the 1934 Grand Jury, which I impanelled as a Judge of the Superior Court. He served first as foreman pro tem. and, during the later and trying months, as foreman of that grand jury which first called attention to the deplorable conditions in the city and county and which brought about a movement which some have called the "reform" movement, but which I prefer to refer to as merely a movement for clean, honest, decent government.

Dr. Buckley was not a reformer. He merely wanted the forces that were undermining local government cleaned out. He was a member of the so-called Committee of 25 that initiated the recall movement. It was due largely to Dr. Buckley's personal persuasion that I was induced to leave the bench and become a candidate for mayor in the recall election.

Subsequently, he consented to serve as a member of the police commission. It was during that time that twenty-three high ranking police officers were dropped from service. Dr. Buckley did much to clean up the Los Angeles Police Department. Although frail in body, he was a fighter. He never compromised. He never quit. He never was afraid. He was one of the most courageous men that I have ever known.

If this community is a better place in which to live, if it now enjoys a better reputation than it did in 1934—and it is and does—much of the credit should go to Dr. John P. Buckley. He was my idea of the finest type of American citizen.

CARL D. LUCAS.

A. B. KELLY

1873-1942

ALBERT BOWLING KELLY, prominent dentist of Yazoo City for fifty years and former member of the Mississippi Legislature from Yazoo County, died suddenly at his home of a heart attack.

Dr. Kelly was a native of Yazoo County. He was a graduate of Mississippi State College and of the Temple University School of Dentistry. For many years, he was a member of the state board of trustees of institutions of higher learning. He served as secretary of the state dental examining board.

His family has long been prominent in the social, civic and religious affairs of Yazoo City. He served as chairman of the board of deacons of the First Baptist church.

Dr. Kelly was a past president of the Mississippi Dental Association and was instrumental in the passage of many dental laws, including the anti-advertising law, while he was a member of the state legislature.

W. R. WRIGHT.

J. H. WINSTANLEY, D.D.S.

J. H. WINSTANLEY was born in Warrington, England, and came with his parents to the United States when he was 5 years old. The family lived in Quebec, Ont., and then moved to Salem, Ore., where Dr. Winstanley received his

early schooling. He attended Hill Military Academy and later took two years premedic work at the University of Oregon before entering the North Pacific Dental college at Portland. He attended Jefferson Medical College in Pennsylvania also and graduated from Vanderbilt University in dentistry at Nashville, Tenn. Dr. Winstanley came west and practiced first at Spokane, moving to Waterville in 1910 and to Wenatchee in 1930. He was a past president of the Wenatchee Chamber of Commerce and a member of the board of directors from 1935 to 1940.

Dr. Winstanley was past president of the Washington State Dental Society, of the Waterville chamber of commerce and of the local Rotary club. He was also a member of the Washington state planning commission and was to serve until 1944. He was a member of St. Luke's Episcopal church and a member of the vestry of that church.

He is survived by the widow and two sons.

DEATHS

BLACK, ROY E., Huntingdon, Pa.; Philadelphia College of Dental Surgery, 1902; died March 7.

BURR, CLARENCE H., Evanston, Ill.; Northwestern University Dental School, 1922; died May 3.

DETWILER, ICY HOWARD, Baltimore, Md., formerly of Chicago, Ill.; Western Dental College, 1914; died February 26.

EDWARDS, WILLIAM H., Pittsburgh, Pa.; University of Pittsburgh, School of Dentistry, 1921; died April 1.

FERRARO, PETER W., Aspinwall, Pa.; University of Pittsburgh, School of Dentistry, 1936; died April 8; aged 27.

GRAHAM, HERMAN J., Chicago, Ill.; Philadelphia College of Dental Surgery, 1897; died April 20; aged 69.

HUGHES, DUDLEY C., New York, N. Y.; University of Pennsylvania School of Dentistry, 1915; died May 4.

INGALLS, HARRY D., Boulder, Colo.; Colorado College of Dental Surgery, 1899; died recently; aged 69.

KEMPTON, ALTON L., Denver, Colo.; University of Denver School of Dentistry, 1903; died in February; aged 70.

KITTOE, PHILIP F., Galena, Ill.; Northwestern University Dental School, 1894; died March 4; aged 70.

KLINE, PAUL A., Denver, Colo.; University of Denver School of Dentistry, 1929; died March 28; aged 34.

LACHOUT, ANDA, Chicago, Ill.; University of Illinois College of Dentistry, 1922; died December 12.

LEAVITT, JAMES GORDON, Captain, U. S. Army Air Corps; University of Southern California College of Dentistry, 1917; killed in airplane crash near Bishop, Calif., December 12; aged 46.

MATTHES, EARL E., Carbondale, Ill.; Washington University School of Dentistry, 1923; died December 13; aged 44.

DE MENDOZA, LEROY, Evergreen, Colo.; Chicago College of Dental Surgery, 1918; died recently; aged 43.

MYERS, JAMES A., Logansport, Ind.; Indiana University School of Dentistry, 1923; died April 19.

RIBA, GERHARDT F., Chicago, Ill., Lieutenant, Army Dental Reserve Corps; Northwestern University Dental School, 1939; died April 12; aged 30.

ROCK, PAUL J., Pittsburgh, Pa.; University of Pittsburgh, School of Dentistry, 1926; died March 27.

ROMANSKY, ABRAHAM, St. Louis, Mo.; St. Louis University School of Dentistry, 1910; died May 27.

STARK, LARKIN ELDRIDGE, El Paso, Texas; Washington University Dental School, 1918; died May 19; aged 57.

TUCKER, WALLACE E., Lena, Ill.; Chicago College of Dental Surgery, 1891; died February 23; aged 74.

WALSH, LEO B., Denver, Colo.; Denver University School of Dentistry, 1914; died recently; aged 50.

WINDLE, BERT O., Delta, Colo.; Western Dental College, 1908; died February 12; aged 69.

CURRENT LITERATURE

Nutrition as It Affects Tooth Decay

By J. D. Boyd

Observations were maintained on a group of teen-age diabetic children (twenty-nine girls and twenty-six boys) over periods varying from forty-one to ninety-nine months, with an average duration of approximately five years. Caries progression was measured in terms of the number of newly carious, or filled tooth surfaces or missing teeth. Only subjects who had shed all carious deciduous teeth at the time of initial examination were used. The incidence of caries was low in most subjects, with long intervals during which no progression of caries in any degree could be demonstrated. Thirty-four per cent of the subjects had no further caries throughout the whole period of study.

The author shows that caries control is not a reflection of a metabolic disorder, but of the adequacy of control of the disorder. The maintenance of optimal nutrition seems to be the most significant factor in metabolic control as it relates to protection of the teeth. These findings are further substantiated by additional cases of diabetes and by studies of non-diabetic children. The experimental diets in all these groups has varied from one study to another, but in most instances the prescribed diets have met or exceeded recognized standards relating to the level of intake for the various food components. The diets were not restricted in the type of sugar or starches.—*J. Am. Diet. A.*, 18:211, April 1942.

J. E. Gilda.

Toxicity of Fluorine in Dicalcium Phosphate

By Floyd De Eds

The toxicity of fluorine present in dicalcium phosphate was investigated with the bleaching of rat incisor teeth as a criterion of injurious action. The sixteen specimens studied had all been prepared before July 1939. The fluorine content ranged from 11 to 498 parts per million, while nine samples ranged from 30 to 66 parts per million. It was found that the fluorine present in dicalcium phosphate was as physiologically active as fluorine administered as sodium fluoride. An average daily dose of 1 teaspoonful of the phosphate contains 0.27 per cent fluorine, which represents an intake ten times as great as that said to produce mottled enamel in at least certain children. It is possible that the beneficial dental results reported as due to the administration of dicalcium phosphate may be due to the fluorine contaminant.—*Am. J. M. Sc.*, 203:687, May 1942.

David S. K. Dai.

Facial Prosthesis

By E. Matthews

The advantages of latex prosthesis over previous materials are many. It is flexible, light, robust and inexpensive and in texture simulates natural tissues perfectly.—*Brit. D. J.*, 72:17, May 1, 1942.

Peter P. Dale.

Care of Face and Jaw Casualties in the United States Army

By Leigh C. Fairbank

The injured in battle are evacuated from battalion aid stations to the division clearing station by personnel from the collecting station and by ambulance. Necessary first aid measures, including urgent surgical intervention to save life, may be instituted at each of the field installations before transfer of wounded to hospitals farther to the rear. When casualties increase beyond the facilities of the division medical service, surgical and evacuation hospitals move to designated points to assist in the care of the wounded. The injured who can travel safely by ambulance or hospital train are transported to general hospitals far to the rear of the combat zone. Non-transportable patients are transferred, when their condition permits. Facilities for the care of face and jaw injuries are limited in the foremost medical installations, but increase as the patients

move toward the rear to larger and more completely serviced medical units. The personnel in each battalion aid station, however, are thoroughly trained in first aid treatment of maxillofacial wounds. At least one medical officer and one dental officer with each surgical and evacuation hospital receives more comprehensive training for this type of casualty. When the need arises, maxillofacial teams are available from the auxiliary surgical group.

Selected medical and dental personnel are trained for the maxillofacial teams, as are specialists to be assigned to general hospitals for surgical reconstruction and dental restoration.—*War Med.*, 2:223-229, March 1942.

J. E. GILDA.

Treatment of Vincent's Ulceration

IN severe cases of ulceration, powder is applied by means of wet cotton. A tooth brush may be substituted as the condition improves. The powder is non-staining, non-irritating and inexpensive and can be applied by the patient. The formula is as follows:

6 parts by weight sodium bicarbonate
1½ parts by weight magnesium carbonate (smooth)
1 part by weight sodium chloride
1 part by weight potassium chlorate

Coloring and flavoring agents can be added, if required.

It is advisable not to institute surgical procedures during active Vincent's infection. If general symptoms develop, the patient should be put to bed, and appropriate general treatment should be given in conjunction with the local application of the powder. —*Brit. D. J.*, 72:192, April 15, 1942.

V. H. POWELL.

Implantation Methods for Setting Fractured Mandibles

By H. C. BERRY

AN appliance for setting fractured mandibles consists of vitallium screws, which are placed on both sides of the fracture, or fractures. Various sized screws are inserted deep in the bone through holes prepared with a special surgical bur. An alinement bar is attached to all the screws and serves to maintain the parts in their correct relationship. The method is adapted to simple fractures, simple unilateral fracture with fragments superimposed, multiple fractures, bilateral multiple fractures and fractures of the angle of the jaw. The method is not restricted to intra-oral use alone, but can be applied extra-orally. Four cases in which an intra-oral appliance was inserted and one case in which a complicated fracture was treated by the extra-oral method are appended.—*Am. J. Orthodontics*, 28:292, April 1942.

J. E. GILDA.

Early Extraction of the Six Year Molars and the Prevention of Dental Caries

By A. Wilkinson

THE author contends that extremely few Anglo-Saxons can accommodate thirty-two teeth without unsightly irregularity due to overcrowding. As a means of preventing this, removal of the first permanent molars between the ages of 8 and 9 years is recommended. About 70 per cent of children treated in this way are caries-free. Contra-indications to the remedy are mesioclusion or distoclusion, absence of permanent teeth or premature loss of the deciduous molars. The dental requirements of a group of forty-eight young people five years after extraction of the first permanent molars were four small fillings.—*D. Rec.*, 62:59, March 1942.

H. B. MCCAULEY.

Conservative Treatment of Simultaneous Fractures Through the Necks of Both Mandibular Condyles Associated with Multiple Fractures of Other Parts of the Mandible

By L. W. GRUBER and J. LYFORD

A STUDY was made of the records of ten patients treated for fractures through the necks of both mandibular condyles associated with concomitant fractures of other parts of the mandible. All were treated by immobilization of the mandible for approximately six weeks, when the non-condylar fracture of the mandible was solidly healed. The mandible in each case was then mobilized. Five patients made an uneventful recovery; three had appreciable loss of function, malocclusion or deviation of the mandible; two suffered ankylosis of the temporomandibular joints and required surgical procedures.

In an additional case, fractures through

the necks of both condyles were associated with fracture of the coronoid process and of the body of the mandible. The patient had delayed treatment for twelve days. The noncondylar fracture was reduced and was immobilized for five weeks. Marked inability to open the mouth was then present. Progressively larger wedges of semihard wood were alternately placed between the upper and lower teeth of the right and the left sides of the mouth over a period of ten days. The force exerted vertically downward through the line of the mandibular ramus overcame the spasm of the elevator muscles and secured a reduction of the coronoid fracture. The condylar heads were unreduced and lay outside the glenoid fossae. Good functional results were obtained.—*Am. J. Orthodontics,* **28**:258, May 1942.

J. E. GILDA.

Maxillary Canine Erupting in the First Molar Region

By G. E. M. HALLETT

A MAN, aged 25 years could not remember having retained the deciduous cuspids beyond the normal period. X-ray examination failed to reveal the presence of a tooth in the upper left cuspid region. A cuspid perfectly normal in size and shape was situated in the first molar region. The tooth was in perfect alinement with the others on that side of the arch and was free from caries. Two other cases similar to this have been reported, but the teeth were not in alinement in the arch. A thorough study of several of the skulls and x-ray films from other cases between the ages of 3 and 10 years failed either to explain the mechanism of movement or to demonstrate the proper alinement.—*Brit. D. J.,* **72**:191, April 15, 1942.

V. H. POWELL.

Unilateral Hypertrophy of the Masseter Muscle

IN a case of previously unreported unilateral hypertrophy of the masseter muscle, the cause of the hypertrophy was undetermined. No dental or orthopedic basis for a compensatory hypertrophy was discovered. Biopsy of the muscle at operation showed a tissue composed of striated muscle, the individual fibers of which were thicker than normal. No other pathologic changes were present. Conservative treatment is recommended. Habit tics, gum chewing and such actions, which unnecessarily exercise the involved muscle, in whole or in part, would probably only aggravate the facial deformity and, in addition, would expose the patient to the risk of suffering an injury to associated structures.—*Surgery,* 11:815, May 1942.

J. E. GILDA.

Reducing Properties of Saliva

By PAUL PINCUS

THE action of saliva on several dye compounds has demonstrated the fact that certain of these dyes, O-chlorophenol-indo-2 and 6-dichlorophenol, can be reduced in a relatively short period of time without additional agents. Some experiments were conducted to determine the source of this action. The conditions probably responsible for this action are centered around the presence of a dehydrogenase and an oxidase, both of which were demonstrated by the experiments. There was some evidence that a bacteriophage is present in saliva.—*Brit. D. J.,* 12: 181, April 15, 1942.

V. H. POWELL.

Mandibular Fractures Treated by Pin Fixation

By M. A. RUSHTON and F. A. WALKER

INDICATIONS for treatment by the pin fixation method are (1) multiple fractures of the edentulous or nearly edentulous mandible with much displacement; (2) fractures in which there is a posterior edentulous fragment, and (3) conditions in which it is necessary to control edentulous fragments for bonegrafting. The apparatus consists of several universal movement clamps and pins so designed that, after the pins have been drilled into the bone and the fracture reduced, the desired relations can be maintained. Rigid control of edentulous fragments in every plane is secured so that any sort of tilting and deviation can be corrected. The apparatus is worn for about four weeks, but has been worn as long as seven weeks. Removal in ordinary cases can be accomplished without anesthesia. Three cases are presented in detail, although twenty-one have been treated

to date. Local sequestration, alveolar abscess or local cellulitis is more apt to follow insertion of the pins, if a proper technic is not observed. Since the jaws need not be fixed together, mouth hygiene and feeding are facilitated, and transport difficulties should be minimized.—*Am. J. Orthodontics,* 28:307, April 1942.

J. E. GILDA.

Frequency of Type Dental Bridge Restorations

By R. W. MALONE

ONE hundred seventy-three restorations made by the author at the Naval Dental School were classified as follows: 1. Fixed or removable type. 2. Position. 3. Type anchorage. 4. Number of bridge units. When one anchorage and rest were used in replacing one tooth, the bridge was considered a two-tooth prosthesis. Of the total number, 158 were fixed and fifteen were removable bridges. Of the former, seventy-eight were anterior and eighty were posterior. One tooth bridges were in the majority (46.7). The three-quarter crown was most frequently used as a retainer.—*U. S. Navy M. Bull.,* 40:358, April 1942.

J. E. GILDA.

Treatment of Temporomandibular Dysfunction Accompanied by Severe Pain Syndrome

By L. I. KOHN

A WOMAN, aged 22, complained chiefly of severe pain, of ten months' duration, in the left temporomandibular region, constantly associated with mandibular movement. There was a negative history of birth injury and trauma. Movement of the mandible was limited in both vertical and lateral excursions. The mandible appeared to be underdeveloped, the right side of the face showing normal contour, while the left presented a flattened appearance. In going through its allowable vertical motion, the mandible swung to the left. Little motion could be detected in the right condyle during jaw movement. All movements were painful. Roentgenographic examination revealed that the left condyle was in a slightly forward relation. A fragmentary stump of the right condylar neck was in relation to the mandibular fossa. The condylar head appeared as a completely detached and encapsulated sequestra displaced medially and lying in the region of the sigmoid notch.

A deep mesio-angular mandibular left impacted molar was removed. This was followed by the construction of a bite-block designed to change the position of the left condyle and to alter the direction of muscle forces. Four months after placement, the patient was free of pain. Freedom of movement gradually returned, with certain changes in mandibular-maxillary relations.—*Am. J. Orthodontics,* 28:302, May 1942.

J. E. GILDA.

Speech Re-Education Following Palatal Reconstruction

By M. HUBER

AFTER repeated palatal operations over a period of years, certain patients develop habits of articulation that must be overcome when the surgeon has provided them with the normal speech mechanism. From a standpoint of normal speech, a functional soft palate is the most important consideration. When the velum fails to assist in nasopharyngeal closure, the patient is unable to generate the requisite intra-oral breath pressure necessary for the production of good plosive sounds (p, b, t, d, g, k). The sounds f and v are similarly affected, and there are other speech defects.

Blowing on a wind instrument and finger massage of the palate are recommended in certain cases with signs of muscular atrophy. Ear training for the recognition of the various sounds also aids in speech re-education.—*Canad. M. A. J.,* 46:325, April 1942.

V. H. POWELL.

Deep Cellulitis of Mouth and Neck Treated with Sulfathiazole and X-Ray Therapy

By J. C. BARB and A. I. SHEPPARD

A FEW hours after the removal of two lower right molars under gas anesthesia, the patient experienced swelling and pain about the area of extraction. This continued, with general symptoms of fever and loss of appetite, for three days, finally necessitating hospitalization. The dental and clinical findings revealed a slight trismus, and swelling in

the submental and submaxillary regions, which extended into the neck. The areas of extraction appeared clean. Lateral jaw x-ray films showed no spicule and no retained roots. Fifteen grains of sulfathiazole were administered by mouth every four hours on the first day until the patient had received a total dose of 45 grains. A chlorazene mouth wash, 1:1,000, and local applications of hot boric acid were used. X-ray therapy was given on the third, fourth and seventh day. An incision was made in the region of the lower right first premolar on the fifth day, after which the swelling in the neck was greatly reduced. The diet was essentially fluid for the first seven days, then was gradually changed to normal. On the tenth day, the patient was discharged from the hospital. —*D. Items Int.*, 64:453, May 1942.

V. H. POWELL.

Human Tissue Response to Orthodontic Intervention of Short and Long Duration

By O. OPPENHEIM

Two teeth of a normal child, four in a subject showing an abnormally low respiratory quotient and two in a child of markedly hypothyroid type, were subjected to orthodontic movement for periods varying from twenty-four hours to three years prior to extraction. Histologic examination revealed absorption of cementum in all cases. In several, the dentin was also involved in the process. Pulp changes, including vacuolation, with compression of odontoblasts and accumulation of fluid in the spaces formed, were attributed to the orthodontic movement. The author believes that the use of slight force over longer periods of time is the procedure of choice.—*Am. J. Orthodontics*, 28:263, May 1942.

J. E. GILDA.

Reattachment of Periodontal Membrane to Cementum

By CHARLES F. BODECKER

THE following consultants contributed to this article: H. R. Churchill, Bernhard Gottlieb, Paul C. Kitchin, Balint Orban and Isaac Schour. The concensus of opinion is that the tooth can be reattached to the alveolus by the fibers of the periodontal membrane if the detachment resulted from injury or idiopathic resorption. If infection or necrosis of tissue or epithelium intervenes, reattachment does not occur. Periodontists are faced with the problem of eliminating these disturbing factors before they can hope for a complete cure of periodontoclasia.—*J. D. Education*, 6:3, 236, February 1942.

Production of Graded Mottling in Molar Teeth of Rats by Feeding of Potassium Fluoride

By VIRGIL D. CHEYNE

THE author presents a method for the production of graded mottling in the enamel of rat molars by the use of potassium fluoride fed soon after birth and during the period of appositional growth and calcification of the permanent teeth. Observations were made upon forty-three Wistar strain animals. The formation period of the permanent dentition in the life of the rat is reviewed. Mild mottling was produced by doses as low as 150 parts per million with extreme change noted at 550 parts per million. The optimum amount for moderate mottling was 300 parts per million. Sex did not influence the susceptibility of the teeth to fluorine. Dental caries can be produced in the molar teeth of rats. Therefore, and because mottled teeth are known to contain considerable amounts of fluorine, the study offers a valuable approach to an understanding of the mechanism of fluorine action in preventing dental caries. —*J. D. Res.*, 21:145-155, April 1942.

Relationship of Dental Caries and Pulp Atrophy

By PHILIP R. DAVIS

TEETH react to irritating external stimulation in protection of the pulp. External irritation, whether from abrasion, erosion, caries or dental restorations, are combated by the pulp, within some limitations, in three ways: tubular calcification, the formation of secondary dentin and calcification of pulp itself. Advancing age brings about denticle formation, sclerosis of the dentin, vacuolar degeneration of the odontoblasts, reticular atrophy of the pulp and formation of connective tissue cysts of the pulp.—*Contact Point*, 19:165-167, February 1942.

RAUL CRUZ.

ANNOUNCEMENTS

ANNOUNCEMENTS must be received by the fifth day of the month in order to be published in the forthcoming issue of THE JOURNAL.

CALENDAR OF MEETINGS

AMERICAN ACADEMY OF PERIODONTOLOGY, Boston, Mass., August 20-22.

AMERICAN ACADEMY FOR PLASTICS RESEARCH IN DENTISTRY, Boston, Mass., August 23.

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY, Boston, Mass., August 22-23.

AMERICAN ASSOCIATION FOR ADVANCEMENT OF ORAL DIAGNOSIS, Boston, Mass., November 12-13.

AMERICAN ASSOCIATION OF DENTAL EDITORS, Boston, Mass., August 24.

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS, Boston, Mass., August 23-25.

AMERICAN COLLEGE OF DENTISTS, Boston, Mass., August 23.

AMERICAN DENTAL ASSISTANTS ASSOCIATION, Boston, Mass., August 24-28.

AMERICAN DENTAL ASSOCIATION, Boston, Mass., August 24-28.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION, Boston, Mass., August 24-28.

AMERICAN FULL DENTURE SOCIETY, Boston, Mass., August 21-23.

AMERICAN SOCIETY FOR THE ADVANCEMENT OF GENERAL ANESTHESIA IN DENTISTRY, New York, N. Y., October 26.

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN, Boston, Mass., August 22-25.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS, Boston, Mass., August 20-22.

DENTISTS IN INDUSTRY, Boston, Mass., August 24-28.

DISTRICT OF COLUMBIA DENTAL SOCIETY, second and fourth Tuesdays in each month, from October to June at the United States Public Health Service Auditorium, Washington.

MONTREAL (CANADA) DENTAL CLUB FALL DENTAL CLINIC, September 23-25.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS, Boston, Mass., August 22-23.

NATIONAL DENTAL ASSOCIATION, Nashville, Tenn., August 10-14.

GREATER NEW YORK DENTAL MEETING, New York, December 7-11.

NEW YORK SOCIETY OF ORTHODONTISTS, New York, November 9-10.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA, Pittsburgh, November 3-5.

PACIFIC COAST SOCIETY OF ORTHODONTISTS, San Francisco, Calif., February 22-24, 1943.

WISCONSIN STATE DENTAL ECONOMIC STUDY CLUB, Madison, July 24-25.

STATE SOCIETIES

September

Southern California, at Los Angeles (14-16)

November

Florida, at Tampa (9-11)

Ohio, at Cincinnati (9-11)

STATE BOARDS OF DENTAL EXAMINERS

Montana, at Helena, second Monday in July. D. H. McCauley, Laurel, Secretary.

North Dakota, at Fargo, July 13-16. L. I. Gilbert, 401 Black Bldg., Fargo, Secretary.

Wisconsin, at Milwaukee, October 5-9. Stephen F. Donovan, Tomah, Secretary.

AMERICAN ACADEMY OF PERIODONTOLOGY

THE twenty-ninth annual meeting of the American Academy of Periodontology will be held at the Copley Plaza Hotel, Boston, August 20-22. Members of the American Dental Association interested in periodontia are invited to attend this program of scientific papers and clinics.

RAYMOND E. JOHNSON, *Secretary*,
824 Lowry Medical Arts Bldg.,
St. Paul, Minn.

AMERICAN ACADEMY FOR PLASTICS RESEARCH IN DENTISTRY

THE fourth official meeting of the American Academy for Plastics Research in Den-

tistry will be held at the Statler Hotel in Boston, August 23, with sessions at 10 a.m. and 2 p.m. Application for admission to the meeting should be made to

LAMAR W. HARRIS, *Secretary,*
25 E. Washington St.,
Chicago, Ill.

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY

THE Fifteenth Annual Meeting of the American Academy of Restorative Dentistry will be held in Boston, Mass., August 22-23, with headquarters at the Copley Plaza Hotel.

W. S. TUCKER, *Secretary,*
940 Canal Bldg.,
New Orleans, La.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF ORAL DIAGNOSIS

THE ninth annual congress of the American Association for the Advancement of Oral Diagnosis will be held in Boston, November 12-13, at the Forsyth Dental Infirmary. The subject of this year's congress will be "The Military Aspects of Oral Diagnosis." Members of the medical and dental professions in the United States and countries of the Western Hemisphere who are interested are invited to attend and can obtain programs by addressing H. Justin Ross, 515 Madison Ave., New York, N. Y.

SHIRLEY DERAAY, *Executive Secretary.*

AMERICAN ASSOCIATION OF DENTAL EDITORS

THE American Association of Dental Editors will hold its annual meeting in the Statler Hotel, Boston, August 24.

O. W. BRANDHORST, *Secretary,*
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

THE American Association of Public Health Dentists will hold its next annual meeting in Boston, August 23-25.

FRANK C. CADY, *Secretary,*
U. S. Public Health Service Hospital,
Lexington, Ky.

AMERICAN COLLEGE OF DENTISTS

THE Boston convocation of the American College of Dentists will be held in the Statler Hotel, August 23, with morning, luncheon, afternoon and evening sessions.

O. W. BRANDHORST, *Secretary,*
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN DENTAL ASSISTANTS ASSOCIATION

THE eighteenth annual session of the American Dental Assistants Association will be held in Boston, Mass., August 24-28. For further information, address

AILEEN M. FERGUSON,
General Secretary,
709 Centre St.,
Jamaica Plain, Mass.

AMERICAN DENTAL ASSOCIATION

THE Eighty-Fourth Annual Meeting of the American Dental Association will be held in Boston, Mass., August 24-28.

JOHN W. COOKE, *Chairman,*
Publicity Committee,
60 Charlesgate West,
Boston, Mass.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

THE nineteenth annual meeting of the American Dental Hygienists' Association will be held in Boston, Mass., August 24-28, with headquarters in the Sheraton Hotel.

A. REBEKAH FISK, *Secretary,*
General Dispensary, U. S. Army,
Washington, D. C.

AMERICAN FULL DENTURE SOCIETY

THE American Full Denture Society will hold its fourteenth annual meeting at the Parker House Hotel, Boston, August 21-23.

H. L. HARRIS, *Secretary,*
1353 Lowry Medical Arts Bldg.,
St. Paul, Minn.

AMERICAN SOCIETY FOR THE ADVANCEMENT OF GENERAL ANESTHESIA IN DENTISTRY

THE fall meeting of the American Society for the Advancement of General Anesthesia in Dentistry will be held October 26 at the Midston House, Thirty-Eighth St. and Madison Avenue, New York, at 8:30 p.m. The

president, James R. Cameron, of Philadelphia, will preside. Adolph A. Walkling, associate professor of surgery, Jefferson Medical College, Philadelphia, will read a paper on anesthesia best suited for injuries and infections of the head and neck. Tracheotomy procedure will be demonstrated with lantern slides.

M. HILLEL FELDMAN, *Secretary,*
730 Fifth Ave.,
New York.

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

THE sixteenth annual meeting of the American Society of Dentistry for Children will be held in Boston, August 22-25, with headquarters at the Hotel Vendome. Members and professional guests are welcome. For additional information, address

R. M. ERWIN, *Secretary,*
613 Corbett Bldg.,
Portland, Ore.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

THE twenty-fourth annual meeting of the American Society of Oral Surgeons and Exodontists will be held in Boston, Mass., August 20-22, with headquarters in the Copley Plaza Hotel.

HARRY BEAR, *Secretary,*
410 Professional Bldg.,
Richmond, Va.

DENTISTS IN INDUSTRY

A MEETING of dentists interested in industrial hygiene will be held during the annual meeting of the American Dental Association in Boston in August for the purpose of organization. For details, address

R. M. WALLS, *Chairman,*
Committee on Economics,
48 E. Market St.,
Bethlehem, Pa.

MONTREAL DENTAL CLUB

THE Eighteenth Annual Fall Clinic of the Montreal Dental Club will be held September 23-25 at the Mount Royal Hotel.

W. S. SWETNAM, *Secretary,*
1410 Guy St.,
Montreal, Canada.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

THE National Association of Dental Examiners will hold its annual meeting August 22-23, in Boston.

R. P. THOMAS, *Secretary,*
Francis Bldg.,
Louisville, Ky.

NATIONAL DENTAL ASSOCIATION

THE National Dental Association will hold its twenty-ninth annual session August 10-14 at the Meharry Dental College, Nashville, Tenn. For further information, address

J. A. JACKSON, *Secretary,*
Charlottesville, Va.

GREATER NEW YORK DENTAL MEETING

THE next Greater New York Dental Meeting will be held in the Hotel Pennsylvania, New York, December 7-11.

WALTER A. QUINN, *Chairman,*
Press and Publication.

NEW YORK SOCIETY OF ORTHODONTISTS

THE next meeting of the New York Society of Orthodontists will be held at the Waldorf-Astoria Hotel, New York, November 9-10.

NORMAN L. HILLYER, *Secretary,*
Professional Bldg.,
Hempstead.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA

THE Odontological Society of Western Pennsylvania will hold its sixty-first annual fall meeting November 3-5 in the William Penn Hotel, Pittsburgh.

M. H. SMITH, *Office Secretary.*

PACIFIC COAST SOCIETY OF ORTHODONTISTS

THE next meeting of the Pacific Coast Society of Orthodontists will be held in San Francisco February 22-24, 1943.

EARL F. LUSSIER, *Secretary,*
450 Sutter Bldg.,
San Francisco.

WISCONSIN STATE DENTAL ECONOMIC STUDY CLUB

THE twelfth annual meeting of the Wisconsin State Dental Economic Study Club

will be held at the Hotel Loraine, Madison, July 24-25. Dentists and their wives, dental assistants and guests are invited. Dentists must present A.D.A. membership cards. For additional information, address

NORMAN C. JOHNSON, *Secretary,*
905 University Ave.,
Madison.

SOUTHERN CALIFORNIA STATE DENTAL ASSOCIATION

THE next annual meeting of the Southern California State Dental Association will be held at the Los Angeles Biltmore Hotel, September 14-16.

ROBERT L. BORLAND, *Secretary,*
602 Chapman Bldg.,
Los Angeles.

FLORIDA STATE DENTAL SOCIETY

THE next annual meeting of the Florida State Dental Society will be held at Tampa, November 9-11.

W. P. WOOD, JR., *Secretary,*
442 W. Lafayette St.,
Tampa.

OHIO STATE DENTAL SOCIETY

THE next annual meeting of the Ohio State Dental Society will be held at the Netherland-Plaza Hotel, Cincinnati, November 9-11.

EDWARD C. MILLS, *Secretary,*
255 E. Broad St.,
Columbus.

MONTANA STATE BOARD OF DENTAL EXAMINERS

A MEETING of the Montana State Board of Dental Examiners will be held in Helena on the second Monday in July. All applications for examinations must be in the hands of the secretary not later than twenty days previous to the opening of the examination and must be sworn to before a notary public.

D. H. MCCAULEY, *Secretary,*
Laurel.

NORTH DAKOTA STATE BOARD OF DENTAL EXAMINERS

THE North Dakota State Board of Dental Examiners will hold its next examination in the Gardner Hotel, Fargo, July 13-16. For further information and application blank, address

L. I. GILBERT, *Secretary,*
401 Black Bldg.,
Fargo.

STATE OF WISCONSIN BOARD OF DENTAL EXAMINERS

THE State of Wisconsin Board of Examiners will hold its next examination at Marquette Dental School, Milwaukee, October 5-9. Examinations will be given for licensure of dentists and hygienists. All applications must be in by September 29. For application blanks and information, address

STEPHEN F. DONOVAN, *Secretary,*
Tomah.

EXAMINATION FOR APPOINTMENT IN THE DENTAL CORPS OF THE NAVY

THE next examination for appointment as assistant dental surgeon, U. S. Navy (lieutenant [junior grade], Dental Corps, U. S. Navy) will be held at the Naval Training Station, Norfolk, Va., the Naval Training Station, Great Lakes, Ill., the Naval Training Station, San Diego, Calif., and the Naval Dental School, National Naval Medical Center, Bethesda, Md., July 6. Applications for this examination should be made to the Chief of the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Applicants for appointment as assistant dental surgeon must be citizens of the United States, more than 21 but less than 32 years of age at the time of acceptance of appointment, and graduates of a class A dental school.

A circular of information listing physical and other requirements for appointment, subjects in which applicants are examined and other data pertaining to salary, allowances, etc., can be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., on request.

LOCATIONS FOR DENTISTS

A NEED for additional dentists exists in many of the vital defense areas. These shortages have arisen because of the great increase in civilian population that has occurred during the year. At present, needs exist in a number of states in communities varying in

size from small villages to large cities. A continuing increase in population will result in overtaxing the dental personnel in many other localities where at present the dentists are very near the limit of their capacities. In many of these defense areas, there are defense housing projects in which office space or living accommodations, or both, may be secured. The United States Public Health Service in cooperation with the Division of Defense Housing of the Federal Works Agency, which supervises these projects, is interested in acquainting dentists with the needs of these communities. If you are interested in securing more specific information about localities for the establishment of practice, communicate with

THOMAS PARRAN, *Surgeon General.*

DENTAL RESIDENCY

THE University of Oregon Medical School Hospitals and Clinics offers a residency in dental medicine and oral surgery, the period of service to be one year, with compensation $40 monthly, in addition to board, room and laundry. The division is under the general direction of the department of medicine and the direct supervision of the head of the division and a visiting staff of sixteen dentists. Service is carried on in the outpatient clinic and the three hospitals. Application blanks will be furnished on request. Direct inquiries to

RICHARD B. DILLEHUNT, *Dean,*
University of Oregon Medical School,
Portland.

RESEARCH FELLOWSHIP IN MEDICINE AND DENTISTRY AT THE UNIVERSITY OF ILLINOIS

THE Graduate School of the University of Illinois has established four research fellowships to be awarded for one year in the fields of medicine and dentistry in Chicago at a stipend of $1,200 per year (calendar year with one month's vacation). Candidates for these fellowships must have completed a training of not less than eight years beyond high school graduation. This training may have been acquired in any one of the following ways, or the equivalent thereof: 1. Work leading to the B.S. and M.D. degrees. 2. Work leading to the B.S., M.S., and D.D.S. degrees. 3. Work leading to the B.S. and B.A. degrees in a four-year collegiate course and to the D.D.S. degree. 4. Work leading to the B.S., D.D.S. and M.D. degrees. The fellowship year begins September 1. Formal application blanks can be secured from the Secretary of the Committee on Graduate Work in Medicine and Dentistry, 1853 W. Polk St., Chicago, Ill.

CARNEGIE FELLOWSHIPS FOR RESEARCH AND GRADUATE WORK IN THE DENTAL SCIENCES

AIDED by the Carnegie Corporation, the School of Medicine and Dentistry of the University of Rochester offers scholarships paying $1,200-$1,800 per annum to well-trained dental graduates who are interested in research or who desire special training in the basic medical sciences as an aid to dental teaching or practice. A few fellowships also offer part-time training in oral surgery. On appointment, the applicant is given the title of Carnegie Dental Fellow and, according to his interest, works as a graduate student in one of the departments of the medical schools. Here, excellent laboratory facilities, adequate direction and close contact with various investigations related to medicine and dentistry help his research and study. Fellows are encouraged to attend medical classes, seminars and staff meetings and, when opportunity presents itself, to participate in class instruction and scientific meetings. Contact with the problems of clinical dentistry may be maintained through the Oral Surgery Clinic of the Strong Memorial Hospital and the Rochester Dental Dispensary. With the approval of the Graduate Council of the university, Fellows may prepare themselves for the degree of M.S. or Ph.D. Applications should be made to

GEORGE H. WHIPPLE, *Dean,*
School of Medicine and Dentistry,
Rochester, N. Y.

COLUMBIA UNIVERSITY SCHOOL OF DENTAL AND ORAL SURGERY REFRESHER COURSES

COLUMBIA University School of Dental and Oral Surgery offers a short course in periodontia for qualified graduates in dentistry September 18, 1942, to January 15, 1943. A ten-day intensive course will include

lectures, discussions, demonstrations and clinical practice. An extended course, one half day per week for two sessions, will include lectures, discussions and supervised technical treatment. Both courses will be conducted by Frank E. Beube, Isador Hirschfeld, Harold J. Leonard (executive officer) and Arthur H. Merritt.

The courses given at the School of Dental and Oral Surgery, Columbia University, are designed to be "refresher" courses; i.e., to bring practitioners abreast of modern undergraduate teaching in theory and practice in the subject. Admission to the course is limited to qualified graduates in dentistry who are members in good standing of the American Dental Association or recognized sectional organizations. In the case of foreign applicants, membership in the applicant's national dental organization is required.

Information can be obtained from the registrar, School of Dental and Oral Surgery, 630 West 168th Street, New York, N. Y.

UNITED STATES PATENTS APPLICABLE OR PERTAINING TO DENTISTRY ISSUED DURING MAY 1942

May 5

No. 2,281,991, PAUL POETSCHKE. Dental amalgam alloy.

No. 2,281,992, PAUL POETSCHKE. Impression taking composition.

No. 2,282,034, CARL J. CHRISTENSEN and LESLIE P. SHEPHERD. Dispensing container.

No. 2,282,035, CARL J. CHRISTENSEN and LESLIE P. SHEPHERD. Dispensing container.

No. 2,282,109, ROBERT C. ANGELL. Folding chair.

No. 2,282,110, ROBERT C. ANGELL. Fluid dispenser.

No. D-132,282, VICTOR A. NOEL and ARTHUR HADLEY MURRAY. Design for a cuspidor stand.

No. D-132,283, VICTOR A. NOEL and EDWIN D. BEEBE. Design for a medical equipment stand.

May 12

No. 282,688, PAUL E. ZUCK and PAUL I. EVANS. Headrest.

No. 2,282,700, JAMES D. BOBBROFF. Toothbrush.

No. 2,282,730, MAURICE KRAFT. Toothbrush.

May 19

No. 2,283,234, ARTHUR E. SMITH. Hypodermic syringe construction.

No. 2,283,314, JOHN L. CKOLA. Hydrodental brush.

No. 2,283,385, DAVID NEUSTADT. Dental articulator.

No. 2,283,560, FRANK P. KRETCHMER. Inspection tool.

No. 2,283,686, ALICE W. MCCUNE. Conditioning appliance for oral and dental use.

No. 2,283,781, DAVID AIKEN. Toothbrush assembly for liquid dentifrices.

No. 2,283,786, MILTON B. BRENNER. Jacket crown.

May 26

No. 2,283,915, SAMUEL F. COLE. Syringe.

No. 2,284,200, FRANCIS J. GRUSS. Gum massaging and teeth strengthening device.

No. 2,284,217, ROBERT H. LIEBERTHAL. Toothbrush pack.

No. D-132,542, HENRY DREYFUSS. Design for an artificial chair.

No. D-132,555, ARTHUR E. SMITH. Design for a syringe.